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A Dream of Tinted Latex

IT having been demonstrated that pure latex can be shipped from the Far East as readily as the coagulated and pressed product of the plantations, and that a vulcanized mix made from it shows a remarkably higher tensile strength than even a compound made from crude rubber, the next step will be to save another important operation, that of coloring the compounds on the mills.

The latex will perhaps be tinted actually at its source and before the rubber tree is tapped. Seems chimerical, but may not some plant wizard impart hues to the fluid before tapping so that latex may be marketed like dyes and paints according to color cards showing all the shades of the rainbow.

With fifty grams of aniline dye in 200 liters of water a German engineer can color a living tree perfectly and permanently in forty-eight hours. By this means, it is claimed, striking imitations can be made of certain natural woods, and through it a new industry is being developed for the further utilization of coal tar dyes.

Non-Essentials Disappear

WHEN rubber manufacturers in 1920 faced mounting inventories, declining prices and sales, they went ahead and cut in all directions. Out of this drastic reduction have grown new methods, so that present factory practice is radically different from that of two years ago.

The factory newspaper, started to keep the workers loyal and contented, and costing $25,000 to $50,000 a year, was stopped. Many psychological and psychiatric experts and athletic directors were laid off. Non-productive workers were checked up and where one floor was considered a day's work for a sweeper he was informed that he must keep the whole building clean. Formerly paid by the hour, he was paid by the day, and given other work when the floors were clean. To men who formerly ran elevators and sat idle between times, was added the function of trucker. Watchmen and gatemen were put to work in their spare time on broken equipment, such as stock books, or cleaning liners.

Common laborers were not the only ones to feel the pinch, however. Non-productive factory clerks were scrutinized just as closely. Whole systems of records that furnished information for the archives, but did not materially affect the keeping of accurate costs, were abolished. Clerks who kept piecework records for one department were given two and three departments. Stock weighers who handled the production of one calender now weighed up for three or four.

But far more significant was the abolition of functional foremanship. The old-time foreman who hired the help, set rates and inspected stock, had become responsible for production only. If a batch of burned sidewall stock got by the inspector at the calender, there was another inspector to tie a rejected tag to it, and the production foreman had to run some more. Things had finally got to a point where it took five foremen to run a department, each with his own sphere to look after. When the cut came, the best two men of the five were picked and one made foreman, the other his assistant. The calender man was given back his gage and told he could run stock to specifications or look for another job.

This did not mean that inspection was abolished. It meant, rather, that divided responsibility was at an end. These changes could only be accomplished with a foreman who had the right attitude. He had to be a man of the right caliber, loyal to the core, and with vision to realize that in these changes was greater opportunity. And he knew that the fact that he was retained on the pay-roll was a mark of the company's confidence.

The cutting of the executive force all along the line brought about greater team work and cooperation. Most companies realized at the time that they were down to a point that they could not maintain all the desired aids to production. But in the gradual rebuilding of their organizations, they profited by the mistakes of the war inflation period. With the efficiency of labor increased twofold, a reduced, but alert executive force, inventories deflated and written off, and cheaper materials, rubber manufacturers are facing a future which was undreamed of in the dark days of 1920 and 1921.

Stevenson Plan Economically Unsound

THAT the Stevenson control plan is economically unsound is the belief of many. It is viewed with alarm by rubber manufacturers the world over, with satisfaction only by stockholders in British-owned plantations. To be sure, if we build a tariff wall to keep British rubber goods out we cannot complain if Britain builds one to keep crude rubber in. That, however, does not alter the fact that a temporary remedy of doubtful expediency has been employed. Buyers will at once look elsewhere for supplies. Forgotten sources of rubber will be rediscovered, plastics but recently abandoned will again be employed, and plantations will spring up where ever rubber can be grown. This is inevitable, and eventually only those whose production costs are the smallest will survive.

Tires Looking Up, and Up

THE automobile industry has apparently entered upon the most prosperous stage of its history; and when it is thriving the rubber trade must perforce share its good fortune. Practically every automobile company is breaking all output records, and many are almost embarrassed with the flood of orders. Wisely enough, the manufacturers have been lowering the prices of cars to meet the reduced purchasing power of the country, even though some substantial losses had to be taken, and the result has been that buyers have been attracted on an unprecedented scale.

Some idea of the remarkable extent of the revival of the industry is afforded by the official figures, which show that for the first eight months of 1922 American manufacturers produced 1,667,052 cars, or 80,000 in excess of the full year of 1921. Of this 159,553 were trucks. The banner year had been 1920, when there were produced some 2,205,197 motor vehicles. It is reasonably estimated from all present indications that 1922 will surpass that record by 200,000 cars more, or a 2,400,000 total, and of which a steadily increasing number is being exported.

One of the best informed men in the industry, Alfred Reeves, general manager of the National Automobile Chamber of Commerce, believes that a registry of 10,500,000 motor vehicles on January 1, 1922, justifies the hope this country should be able to use 15,000,000 motor vehicles within another twelve months, and of them 3,000,000 will probably be trucks. This should insure a renewal demand of from 2,000,000 to 2,500,000 cars. One does not have to be much of a mathematician to figure out what this means in new tires; nor much of an optimist to see, in consequence of this extraordinary tire demand, a considerable and profitable expansion of the rubber business.

With the rise in the price of plantation rubber comes the necessity for greater amounts of reclaimed stock, and for added activity in wild rubber. That prices of all rubber goods should at once be increased follows of course. Incidentally there be those who predict that the rubber surplus bogey will soon be a thing of the past.

Edison and Clock-Watchers

THOMAS A. EDISON says he wonders where he and his inventions would have been had he fifty years ago been beguiled by some labor leader, who toiled more with his tongue than his hands, into believing that eight hours' work was enough for a day and that he should not give his fellow workers the best that was in him. He grieves to see young Americans fettering themselves with rules that give the shirker and clock-watcher as much benefit as the most ambitious and industrious, that bring all down to a dead level and discourage progress and initiative. A real labor leader, he says, would be one who would be wise enough to have the courage to make union men prouder of their productions, capable of assuming better jobs and sharing, too, in larger responsibilities.

Resignation of Dr. Stratton

A MARKED improvement has of late been made in the administration of national affairs but it is regrettable that it can not be extended a little farther, as, for instance, in the way of providing at least a living compensation for public servants of exceptional merit. Unable to live in Washington on his government allowance, Dr. Samuel Wesley Stratton, director of the Bureau of Standards of the Department of Commerce for 21 years, has resigned and accepted the presidency of the Massachusetts Institute of Technology at three times his former salary.

With inadequate facilities, practically ignored by those who disburse the Nation's funds, the director and his capable and equally ill paid staff have continued their work, which is of the first importance to the rubber and indeed to all industry.

Dr. Stratton's loss will be keenly felt. Perhaps, but it is not probable, his resignation acting as a dignified rebuke may inaugurate a more appreciative and generous handling of the most important of the Nation's bureaus.

Rubber Milk Made in the Laboratory

Process as Outlined by Luedersdorff, Alexander, Traun and Others

By Gustav Heinsohn

THE widespread interest in rubber in the form of latex, not only on the part of paper manufacturers, but rubber men as well, is one of the outstanding features of rubber thought today. That so-called synthetic rubber milk can be made from both crude rubber and reclaimed rubber is, therefore, of the greatest moment. The story begins with some very curious researches into the nature of rubber latex. Experiments to determine its commercial value when treated with various coagulants, solvents, and vulcanizing agents, and even its manipulation in a way akin to the pulp-making and beating process in paper-making, were made even before Goodyear's discovery of vulcanization, by a German chemist, Luedersdorff.

Ninety years ago, he told how at that time rubber was received from South America in three forms. First, in bottle-shape, that is, dried and smoked in many layers on gourd-like clay molds, or roughly fashioned so as to be made up into overshoes; second, as "sheets" (gummispeck, i. e., rubber bacon) 1 foot wide, 2 feet long and 2 inches thick; and, third, as "a liquid contained in tightly closed copper vessels or in india rubber bottles."

From his own investigation, and examinations made by other scientists, Luedersdorff concluded that the essential rubber constituent of latex "is by no means really dissolved in the sap of the plants carrying that substance, but only distributed through it in exceedingly small, though soft and yielding particles, which, in obedience to organic laws, are perhaps enclosed in these envelopes of vegetable albumen. The sap of these plants, therefore, always appears as a white, transparent milk, from which, after the removal of the watery portion, the little particles of india rubber collect together in a mass. For this reason forms of clay are chosen, on which to make the bottles, because the clay absorbs a large part of the moisture and leaves the rubber behind upon the surface in the shape of a thin skin. By frequent application of sap to the forms, the thicker bottles are produced. These are dried by the fire in order to prevent the putrefaction which would be occasioned by the vegetable albumen that is coagulated with the rubber, and afterwards the form is removed by being softened or broken.

"The liquid india rubber which is found in the market has a general resemblance to the milk of the plant, but is somewhat thicker, quite like cream. Its color is pale yellow, its odor sourish and stinking. It soon becomes covered with a thin skin of coagulated india rubber, which possesses the properties of the ordinary rubber.

"In order to obtain the india rubber from this liquid in as pure a condition as possible, we place the liquid with four times its volume of water in a vessel, which is provided with a tap at the bottom, and let the whole stand twenty-four hours. During this time the india rubber rises to the surface since it is lighter than the remaining sap. Then we tap it very carefully, because the caoutchouc swimming on the top is easily mixed again with the sap. We thus have india rubber in exceedingly fine portions which are loosely joined together and which, at the least stirring, mingle again with the water, forming a white milk. In order to make them unite we have only to draw off as much of the water as we can and pour the remaining concentrated milk upon blotting paper or dry clay. The remaining water is thus absorbed and the particles of rubber, touching each other, unite into a mass which forms a white opaque skin, and only becomes transparent and clear after some time through the loss of the water which it contained."

Luedersdorff's Rubber Milk

Those who doubt that caoutchouc can be effectively worked up in an aqueous mass may be interested in learning that Luedersdorff found no difficulty in accomplishing this desideratum, even with the crude means then at hand. Touching on compounding rubber with coloring matter (in this case using sheet rubber or "gummispeck" dissolved in rectified oil of turpentine in which 3 per cent of sulphur has been added by means of heat), the German chemist wrote:

"The mixing is performed as follows: We either grind the color fine in some of the sulphuretted oil of turpentine and join it with the mass while reducing that; or we grind it in water and afterwards knead it into the prepared dough. If the dough is made of bottle rubber, it becomes cloudy and milky in the last case, but it loses that appearance as soon as it is dried by being worked. Although the dough contains oil of turpentine, which does not directly mix with water, it need not be feared that it will refuse the wet coloring matter. Indeed, if this has consistence, and is not too thin, the dough unites with it very readily.

"Even pure water can be combined with the dough by kneading; india rubber, even when dissolved in ethereal oil, shows a disposition to take up water, and we can make a transparent dough of it milk-like by kneading water into it. Of course the water disappears when the mass dries, just as it does out of the sheet rubber which contains water.

"Any powdery substance in a moist state, e. g., wet clay, flour paste, and the like, may be combined with the rubber dough in any proportions, as well as the wet coloring substance. We can rub in so much of a thick solution of gum arabic, that when we pour water upon the mixture and thus extract the gum arabic, the dissolved rubber swims upon the liquid in the finest particles like cream, and thus resembles in some manner, even to the softness produced by the ethereal oil, that which is distributed in minute particles in the original sap."

Alexander's Rubber Milk

Recovering waste rubber, that is, destroying the fiber of cloth insertion, and bringing the product back to the form of a dough, is an old story in the rubber world. Indeed, so far has this part of the industry progressed that recovered rubber is often as good, and, strange as it may seem, sometimes better than the original crude rubber. To go back still farther, however, and turn crude rubber into latex or at least into an aqueous solution and farther still to change vulcanized rubber into recovered rubber and that into an aqueous solution was much more difficult of accomplishment.

The Luedersdorff experiments with crude rubber, to a degree perhaps, pointed the way, but it was years before anything was done. Solutions of rubber by the hundred were made, but the solvents were always of the alcohols or lighter oils. During the experimenting with the solution of vulcanized scrap, Alexander developed a process for the treatment of solutions of crude rubber or vulcanized rubber and the "production of aqueous caoutchouc solutions resembling the original milk."

The rubber was first cut or ground very fine. Then 1,000 pounds were mixed with 3,000 pounds of benzene and held under pressure to 150 C. for three or four hours. The undissolved matter was then removed and the solution, to which was added 200 pounds of sodium hydrate in 350 pounds of water, was again

heated for three hours to 150 C. Then the benzene was removed by steam distillation and an aqueous solution was the result. In other words, this was reclaimed rubber milk.

The Traun Rubber Milk

The colloid mill, a recent German invention, curiously enough, quite recently opened the way for the production, from waste vulcanized rubber, of aqueous solutions of caoutchouc. This mill, in a word, puts matter in a much finer state of dispersion than has heretofore been possible. The well-known Traun Rubber Company, of Hamburg, took waste vulcanized rubber, preferably of high-grade goods, and applied "extraordinarily intensive mechanical disintegration," that is, they used the colloid mill up to the limit. And they ground it in a large quantity of water. To aid in this fine dispersion they added small quantities of soaps of fats or resins or small quantities of colloids, such as glue dextrin or the like. They also sometimes used a swelling agent as benzine. In their own words, "The result of such treatment is to yield a homogeneous product somewhat resembling rubber latex." In other words it is rubber in a high state of dispersion, and the dispersion medium or solvent is water. The process more in detail is as follows:

To illustrate the invention, three examples are given, of which we give the first: Ten parts of ammonium sulphide, 1 part of caustic alkali, and 2 parts of potash soap are dissolved in 100 parts of water. At a temperature of 100 to 110 degrees C. there is then added 10 parts of vulcanized soft rubber, e. g., waste rubber from automobile tires in the crumb or granular form. This mixture is then intensively mechanically disintegrated, preferably in a colloid mill.

The mixture may be passed through a disintegrator of the beater type in which the beater arms run in liquid at very high speed (peripheral speed of 2,000 meters per minute) and pumped by a mud pump into a reservoir and then continuously circulated between the reservoir and the disintegrator. It is preferable, but not essential, to heat the reservoir and liquid by steam to 100 degrees C. The rubber and liquid form a homogeneous mass even after disintegrating for half an hour. After one hour, an emulsion-like appearance is observed and the free sulphur has already been extracted and is present partly in the colloidal form and partly dissolved by the ammonium sulphide. Further treatment depends on the final product desired.

The mixture may be cooled by the addition of cold water with continued disintegration, and the sulphur can be extracted from the emulsion with organic sulphur solvents. The rubber can be separated from the emulsion by ultra-filtration or by coagulation. They can be treated for a second time in the same dispersion medium for several hours with fresh addition of alkali when the chemically combined sulphur is partly removed.

By increasing the addition of alkali to about 10 parts, almost the whole of the free and combined sulphur can be removed by a single disintegration. An alkali sulphide solution can also be employed instead of alkali and ammonium sulphide.

Dispersion accelerators can also be added instead of soaps and swelling agents or solvents are suitable for this purpose, e. g., benzene, toluene, xylene, pseudo-cumene, mesitylene, tar-oils, resin-oils, vegetable-oils, dichlorhydrin, aniline, toluidine, zylidine phenol, cresol, etc. These substances can also be used in admixture with those specified above. By addition of 10 parts of benzene or xylene, etc., and 5 to 10 parts of caustic alkali, the extraction of sulphur can be performed without addition of ammonium sulphide.

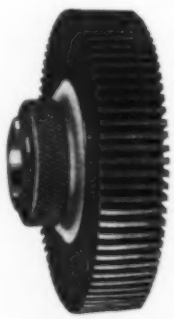
It has further been demonstrated that vulcanized soft rubber can be highly dispersed in ordinary water without the addition of alkali if one of these dispersion accelerators, preferably colloids such as colophony, glue, gelatine, casein, protein, etc., is added together with 5 to 10 per cent of one of the specified hydrocarbons. The process is, however, always accelerated by the addition of alkalis.

The Brothers Water Solution of Rubber

This invention really related to the manufacture of a puncture-closing dough for tires. It, however, is directly in line with the water solution of rubber and is, therefore, of interest. Mr. Brothers takes vulcanized rubber sponge waste or clippings and grinds them to powder. He then mixes colloidal clay with water in the proportion of four of rubber to thirty-two of clay. This he grinds up in water and effects a solution that pours readily, and distributes the rubber content where it will do the most good.

U. S. M. CO.'S RUBBER FINISHING WHEELS

It requires only a casual glance into any shoe repairing establishment to notice the great increase in the use of rubber in the mechanical equipment. In the finishing of shoes, wheels and rolls with a corrugated rubber surface are used, particularly for burnishing or applying wax to the bottoms, shanks and heels. These corrugated rubber wheels and rolls include heel and shank wheels, spring heel wheels, heel breast wheels and bottom rolls. The corrugated rubber wheels and rolls were the first types used and are coming into the trade now more rapidly than ever. They are especially valuable when a quick fine finish must be obtained.



Heel Wheel

Shank Wheel

The corrugated wheels and rolls have wood centers, upon which is a surface of corrugated rubber straight across the face. Over the wheels and rolls a suitable finishing cover is attached so that in revolving a correct pad is formed for burnishing, resulting in the exact finish desired. In other words, when speed, combined with good work, is necessary, these rolls are used preferably.

Bottom Roll

With the tremendous increase in the amount of shoe repairing being done, the use of these rolls has become greater than ever during the last few years and an extensive business has been developed. They are so made that they are especially durable and frequent replacements are not necessary even though the work be heavy. On some of the more delicate work, however, felt rolls and wheels and pad brushes have the call because they are less harsh in operation.

SLATE FLOUR

The possibilities of slate flour as a filler in compounding are attracting the attention of rubber manufacturers. The results of government tests, together with opinions expressed by several rubber chemists, indicate that slate flour of fine grade can be used in certain rubber goods to advantage. Slate flour of a uniform degree of fineness and freedom from grit is now being produced commercially.

The Past, Present, and Future of Fiber Soles[1]

Consumer Demand—Sales Stimulation—Educational Propaganda—Government Tests and Conclusions

By Chester C. Burnham

THERE are a great many types of shoes which might better be soled with fiber soles than with leather soles and yet, if you will visit your local shoe dealer you will be surprised at the scanty and broken assortment he will show you. It has been proven again and again that fiber soles will outwear leather soles besides possessing other admirable qualities over leather. But even if one is not favorable to fiber soles because of their increased wearing service they should be for the feeling of surefootedness which they give, the short (if any) breaking-in period which they require, the waterproofness and guaranty of uniformity which they offer.

If you seek for information concerning the present traffic in fiber soles you will gain little from your local shoe dealer other than a few remarks to the effect that the public do not seem to care for them. If you talk with shoe manufacturers you will find they are using comparatively few, and mostly on sport styles. If you ask for them of your local repair man you will likely find them but you will be surprised to learn that there is very little call for them and that they are the exceptional repair job rather than the rule.

FIBER SOLED SHOES WORN TWO MONTHS AND TEN DAYS BY ARMY OFFICER

PAIR OF SHOES WORN 50 DAYS; RIGHT—FIBER SOLE SLIGHTLY WORN; LEFT—LEATHER SOLE WORN OUT

Naturally there is a reason for this lack of public and trade interest and it is with the hope that I may assist in reviving this fine industry and profitable line that I choose to review some of the causes which have undoubtedly been responsible for the decreased sales and less general usage at this time.

It must be admitted at the outset that fiber soles got little support from the leather sole houses. These leather merchants smiled wisely and sang the old song a little bit louder, "There's nothing like leather." Thus whatever sale and introduction fiber soles did get must have come from sheer merit alone rather than from any friendly boosting. Yet with the leather field against them and with leather soles preferred in many quarters and strongly intrenched through years of shoe manufacturing practice, fiber soles did come quickly into prominence about 1914. At that time one of the selling points claimed for them was that their composition included a large percentage of fiberized leather and they might be treated in the shoe factory *exactly as was leather*. It is entirely true that these new soles had many more characteristics of leather than had the old composition or pigment soles but it was probably straining a point somewhat when it was loudly claimed that they could be cut, stitched and trimmed like leather. The introduction of fiber into the rubber sole compound caused such soles to be called fiber soles and in this respect they are *structurally* different from the former rubber sole or pigment compound of shoemaking commerce.

Consumer Demand Established

Be that as it may, it was certain that a goodly consumer demand quickly followed the first showing and soon after this demand numerous fiber soles appeared on the market. If all these soles had been tested and true, a different story might have been written here but unfortunately many inferior soles were offered and often with the same guaranty as the better grade, so that the shoe manufacturer, shoe dealer, and the public were bewildered. Much was claimed for these new fiber soles and for a time some of these claims appeared extravagant but in the keenness of selling competition this was overlooked. Some companies guaranteed their soles to outwear the entire shoe and offered *a new pair of shoes* if the sole broke before the sole was worn through. This was wonderful propaganda at a time when the public had tired of breaking composition soles, and others willingly copied it or were forced to make an equal guaranty because of the fierce competition.

Prices which were pretty fair at the start began to show the effect of this sharp selling competition and about this time it was possible to purchase women's 9-iron soles for 12 to 14 cents a pair and with this, full shoe replacement guaranty was given.

Unwarranted Guaranties

We must assume that this and all guaranties were made in good faith but however made, it could not withstand inferior merchandise and when many of these fiber soled shoes were returned for claims, several fiber sole makers were forced out of business or were forced to abandon their line of soles. If we are inclined to blame the rubber manufacturer for offering such merchandise we must also criticise the shoe manufacturer and dealer who accepted this merchandise and guaranty without looking to see what was behind it. It has always seemed to me there must be a two-fold obligation in a guaranty of this kind which resembles the story of the old colored man who offered to hold the stakes of a bet. "Da's all right," said the bettor, "but who's going to hold you?"

This early failure of some of the fiber soles was the first act which caused the public to lose interest in them. The public had

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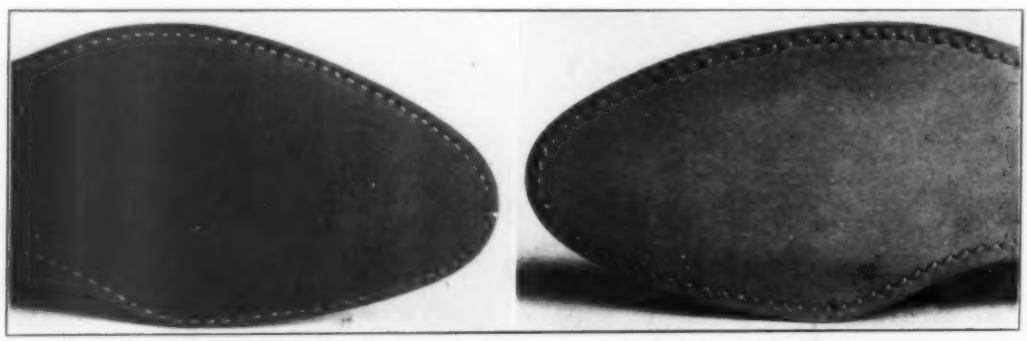
accepted them as an improvement on rubber soles and was prepared to endorse them on several grounds but when it found that they were subject to the same or equally bad ailments and failures as rubber soles and that after all, they did not live up to their reputation, the good were classed with the bad and all were condemned.

Active Sales Stimulation

The second act soon followed and in an unusual manner. The public wanted rubber soled shoes and plainly preferred fiber soles in spite of the failure of some to give satisfactory service, and thus they soon responded to the active advertising and sales campaign of some of the more prominent firms identified with fiber sole making. The trade journals and magazines were carrying full page advertisements for the shoe trade and for the public, telling about the wonders of these soles. Several nationally known companies carried on campaigns and *led by this enormous sales stimulation*, shoe manufacturers sent their salesmen out with a generous showing of fiber soled samples and a big season was expected.



CORRECT STITCHING INCORRECT STITCHING

UNLESS FIBER SOLES ARE CORRECTLY STITCHED THEY WILL NOT WEAR. NOTE HOW THE SOLE ON THE RIGHT HAS BEEN BROKEN BY THE AWL

In order for the reader to fully appreciate the psychology of what is to follow it should be known here that almost every traveling shoe salesman works on a commission basis. That is to say, his earnings are directly proportioned to the amount of shoes shipped to his customers. The salesmen went out with these fiber soled samples and sold them by the carload with the result that the rubber manufacturers could not keep pace with the demand and were hundreds of thousands of pairs short on their orders. Retailers waited in vain for their shoes and finally cancelled their orders when it became known that the fiber soles were not on hand with which to make up the shoes. The situation was so desperate that many retailers accepted inferior soles because they felt they had to have *some kind* of fiber sole even if they did not have what they originally ordered.

This caused endless trouble and loss and, as you may judge, deprived shoe manufacturers, shoe jobbers, *and shoe salesmen* of fat commissions which they had estimated as surely earned. It is an old story now among the shoe trade but it was practically impossible to get these same salesmen to go out the next season and push fiber soles. They carried them, to be sure, but their heart was not in their work when they set out to tell their virtues. They often forgot everything except how much money they lost the previous season. The failure to deliver soles at the outset soured the trade and caused the most serious set-back the industry has had.

Educational Propaganda

In spite of this and the other set-backs, fiber soles continued to sell, and were due to withstand still another shock. The shoe manufacturer was unwittingly responsible for this. In spite of some of the early claims, it became evident as more fiber soled shoes were made, that these soles *could not* be treated in the shoe factory exactly as was leather. It was discovered that the sizes of thread, awl and needle had frequently to be changed to get the best results and when it came to finishing the edges and bottoms, much was to be desired. It seemed as though retailers were going to insist on a finish equal to that of leather and they said, "A shoe well finished is half sold." It is very hard for a shoe factory man to change his regular practices, and to get him to change all these details was a superhuman task but the rubber men came to realize that some educational work must be done for the ultimate good and proceeded to do it in manly fashion.

At first these emissaries were not greeted with much enthusiasm but later their work was very fruitful and gradually there came on the market better made and better looking fiber soled shoes. But it was too late to save the situation for by the time factories got into the new swing of things the public was pretty well fed up on poorly stitched and roughly finished fiber soled footwear and they simply "quit cold" and would have nothing more to do with them. The bargain basement counters were piled high with such shoes and at least one large manufacturer retired from the field after spending huge sums of money for equipment and advertising and dumped nearly a quarter million pairs of soles on the market at prices estimated to be in the neighborhood of 5 cents per pair.

The Breaking Point

This was the breaking point and for a time pandemonium reigned. After it was all over and rubber men began to take account of stock it was discovered that the fiber sole business was a thing of the past so far as big volume was concerned. Very likely the ending of the war had something to do with it, moreover, as sole leather became more easily obtainable and at slowly descending prices the crying need for fiber soles from an economical standpoint became less acute and it was indeed easy for the shoe manufacturing trade to again take up the old refrain, "There's nothing like leather." I am not quite willing to admit the truth of this old song, for sufficiently good results were obtained with fiber soles to warrant their being brought to a higher point of perfection but with the demand sadly decreased, the producing companies lost interest also and this brings the situation down to the present time when there is a very little traffic in them except through several companies who have stuck to their lines and dominated what little business was available.

It would appear that a product which had stood for so much abuse in introduction methods and usage and which still retained many admirable qualities to commend itself to the trade, could certainly be perfected and successfully introduced to the trade generally. I believe it *can* be done and *should* be done but whoever undertakes this work must build safely and securely step by step. The broken down bridges of former failures must be re-

paired and rebuilt of indestructible material so that the product shall not again be condemned for the same faults.

United States Bureau of Standards Makes Tests

Nothing I could write regarding fiber soles could be more convincing than the report of the United States Bureau of Standards regarding these soles. This department has seriously gone out after the facts and has secured an impartial résumé. No one will deny the authenticity of this important governmental report.

It will be remembered that during the great world war the prices of sole leather soared to great heights and only the lower grades were obtainable for civilian wear as all the prime selections were required for army use. It became a question how long this prime selection would be sufficient for the army and with a view to the future needs, the Department of Commerce through its Bureau of Standards made some exhaustive tests of leather and fiber soles and thus we have some very valuable and interesting data for our consideration.

The chief object of these tests was to determine the adaptability of composition soles to the wearing conditions of military service and in this connection two other interesting points were brought out: (1) the wearing qualities of composition material as compared with that of good oak sole leather and (2) the wearing qualities of different brands of fiberized soles as compared with each other.

This investigation was impartially carried on and the brands selected were widely advertised and extensively used products which would indicate that they had been successfully used in civilian trade. These soles were placed on regular marching shoes which were constructed according to specifications drawn up with the assistance of the Quartermaster General. In order to eliminate as many variables as possible it was thought preferable to conduct the tests by having soldiers of the infantry organization wear the shoes and thus the conditions of wear would be practically the same for all soles. One shoe of each pair was soled with leather and the other with fiber, thus making each pair of shoes an individual test in itself.

Great care was exercised in making the tests and the supply sergeant in each company was furnished with report blanks which were in the form of weekly reports on which were recorded the number of days the shoes were worn, the duty performed on that day and the weather conditions. The shoes were inspected weekly and at such times when the soles were sufficiently worn or damaged, the test was discontinued, the soles being removed from the shoes.

There were four fiber soles used which are designated in the tables by the letters A, B, C, and D. Fifty-nine pairs were tested and the following table accounts for 40 pairs of shoes as follows:

Table I

SUMMARY OF FAILURES

Fiber Sole Code Letter	A	B	C	D	Totals
Failure by leather sole wearing out first	5	4	1	3	
Failure by fiber sole wearing out first	1	1	..	4	6
Failure by cracking of fiber sole	..	1	2	..	3
Failure due to stitches pulling out of fiber sole or wearing and breaking off at the toe	2	5	9	2	18

Nineteen pairs were lost track of through transfer of men from the cantonment or where both soles wore out at the same time. It must be understood that these were war times and accurate track of many things was lost. Much history is written in the above table and the following figures represent only the actual wearing away of the material without reference to the methods of failing. 100 per cent wear means that the sole wore through.

Table II accounts individually for some of the pairs mentioned in Table I and shows the percentage of failure or success.

In considering this table it should be noticed that most of the failures of the fiber sole were due to faulty processes in shoe manufacture and not to the fiber sole as a product. At the time

Table II

DETAILED ACCOUNT OF WEAR

Pair No.	Per cent Wear Leather Sole	Per cent Wear Composition Sole	Pair No.	Per cent Wear Leather Sole	Per cent Wear Composition Sole
2	100	80	39	49.5	33.5
4	100	33	41	100	100
9	66	63	42	75	38
10	100	64	44	71	66
11	100	68	45	57	63.5
12	68	77	46	35	40
15	88	100	47	85	100
18	44.5	44.5	48	88	57
19	100	68	49	100	71
21	77	57	50	75	100
27	61	65.5	52	83	57
30	49.5	47.5	53	69	100
31	88	100	54	47	28
34	100	54	55	100	74
35	77	73	57	100	57

Totals: 30 pairs, leather, 2353.5 points; fiber, 1979.5 points.

this test was conducted little attention had been given to improved methods of handling fiber soles in shoemaking. The fiber sole makers were still loudly proclaiming that their product could be used exactly *as was leather* and shoe manufacturers were either too busy to doubt this statement or were content to let them make good on their own presentation. Later they awoke to the true facts and in the light of what has been done in an educational way it seems to me that we have a wonderful inducement to continue this educational work so that the time will come when we can be assured that the shoe factory methods of application will be so understood and executed that the percentage of failures from faulty application will be at a minimum.

Educational Work Necessary

No later than this morning I was in receipt of a communication mailed from the head office of a large shoe machinery firm with offices all over the world, telling me that my local shoe repairer around the corner has complied with certain details consistent with good repairing methods and has therefore been awarded an official sign to be placed over his store indicating his adherence to standard and safe repairing practices in his shop. The very fact that this principal company has found merit in this matter of education and assistance is proof positive that such education is necessary, and may well extend to the actual manufacturing of shoes as well as the repairing of them.

The educational problem with the shoe manufacturer is one requiring accurate knowledge and tact while the problem with the shoe repairer is more complicated because of the failure of the repairer in many cases to follow the teachings of good literature and the trade press. They are not so open to education through the ordinary trade channels. When customers insist on better work from their repair men and when shoe retailers insist on better made fiber soled footwear from their shoe manufacturers, then we shall be making actual progress. Educational work seems to have reached a point now where to be ignorant of the actual requirements on such matters constitutes a case of wilful negligence on the part of the shoe repairer and shoe manufacturer.

Discussion of Report

From Table I it will be seen how important this educational work is to be. Out of 40 pairs of shoes under discussion in this table, 27 pairs were not satisfactory. It makes no difference, for the minute, what the trouble was, the fact remains they were unsatisfactory. But 18 pairs were unsatisfactory because of faulty workmanship in the shoe factory. Almost half the trouble was in the shoe manufacturer's hands to remedy while 9 pairs (six pairs that wore out and 3 pairs that cracked) was with the rubber manufacturer. If we wish to make a direct comparison we might say that poor shoe making processes were twice as much to blame for these failures as poor fiber sole making. In fact we cannot be sure that the three pairs of soles would have cracked had they been properly attached. Very often the shoemaking has much to

do with the cracking of the soles and often a combination of shoemaking ills can reduce any good sole to a failure when under test.

The conclusions and suggestions of the Bureau of Standards regarding fiber soles are intensely interesting and furnish sufficient food for much thought and study. In discussing various qualities, desirable and undesirable, they mention the following specifically. The author's comments are in *italics.*

PLIABILITY. The fiber soles were more pliable than the leather and hence the shoes would bend more easily under the ball of the foot when walking or marching.

It is this quality that causes fiber soled shoes to be "broken in" much more easily than are leather soled shoes. Therefore it may be concluded that for people with tender feet, fiber soled shoes would certainly be a boon and certainly they would not be overlooked by traveling salesmen and others who are forced to walk much and be constantly on their feet.

WATERPROOF QUALITIES. No complaints were made that moisture penetrated the fiber soles. It is undoubtedly true that fiber soles are absolutely waterproof but when worn thin, stitches pulled out, toe worn off, or when soles become cracked, moisture will wet the foot and hence the fiber after that point has no advantage over leather.

We believe that when leather soles are worn thin they will behave in a similar manner and we are certain that they will wet the feet when encountering moisture. Such shoes may be resoled with fiber again or with leather, at the owner's option. Every shoe repairer can furnish you with a durable fiber "tap" or halfsole or he can do the better appearing and only slightly more expensive job of "full fiber sole."

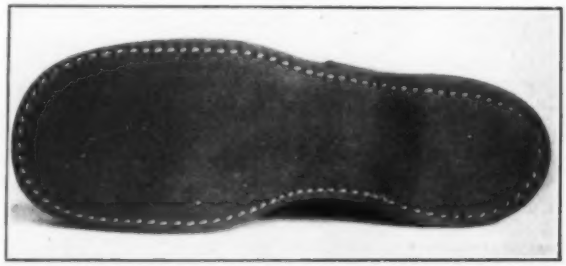
WEIGHT. The average specific gravity of all fiber soles tested was 1.30. That of the leather before being treated with a waterproofing compound was 1.01 and after being treated was 1.11. Inasmuch as the values of the specific gravity of all the materials of the same type were nearly the same, the average figure values only are presented here. From these figures it is seen that the fiber soles were practically 29 per cent heavier than the untreated soles and 10 per cent heavier than the treated soles. A pair of size 11 leather soles, 10.5-iron, would weigh about 14 ounces. The use of composition soles of this same thickness would then increase the weight of the shoe about 4 ounces.

The specific gravities herein suggested for leather soles seem very low indeed and it is worthy of comment that some interesting comparisons of commercial leather soling might be made. Selected soles are hardly a fair standard in this matter when considering the problem from a civilian viewpoint. Note also that the Government report makes no comparison in costs—a very vital feature.

GRIP OR FRICTION QUALITIES. The softness of the fiber soles as compared with leather allows them to conform more closely to the objects which they come into contact with when in use. This yielding property gives them a better hold or grip and hence they will resist the action of slipping better than leather soles. This quality was noticeable in cold weather when snow was on the ground and the tendency to slip was at a maximum. Several men stated that while walking the shoe which was soled with leather would slip considerably while the fiber sole gave no trouble in this respect.

Here is an admirable quality brought out by this test. Think of the thousands of school children who would appreciate this quality of non-slipping on ice and snow. Think of the thousands of middle-aged and elderly persons who are naturally timid when walking in slippery places and whose failing sight makes them less sure-footed in stormy weather, yet who could walk with security and comfort in fiber soles.

EFFECT OF HEAT OR COLD. None of the men wearing these test shoes were required to report on the effect of heat or cold on their feet when wearing fiber soles because it was thought that putting the idea in their minds might possibly prejudice their reports in advance. The conclusions drawn here were made from chance statements given while the inspection was going on. In many cases the remark was made that fiber soles were fine for a winter shoe and there seemed to be no complaint that this material made the foot colder. There were several remarks made to the effect that in warm weather these soles burned the feet. This



THE STITCHING AWL HAS CUT THIS SOLE NEEDLESSLY AND IT WILL BREAK AWAY AT THE TOE

effect would be very noticeable after a long march and it was noticeable that several men would wear these shoes only a part of the day in warm weather. One case in particular can be cited where a soldier whose duties were practically all in the barracks could not give the fiber soles too much praise in the winter but when warm weather came, he practically reversed his opinion and said they made his feet very hot and uncomfortable. It is difficult to determine just what causes this effect. It may be that the feet perspire more due to the extra muscle action of the foot caused by the shoe being more pliable, or that the composition sole prevents the heat from escaping from the shoe or that the fiber sole actually does transmit heat to the foot in a greater degree than does leather. In the latter case it would seem as though the heavy middle sole would counteract this quality.

It should be considered that the army test shoes were made with a fiber outsole and a good substantial leather middle sole between it and the bottom of the shoe.

Retail shoe dealers and clerks will tell you that it is possible to get a larger foot into a certain sized shoe with a fiber sole than it is in a similar shoe soled with leather. The reason for this is undoubtedly found in the fact that the more flexible sole allows a high instep foot to slide in by the vamp seam of the shoe. Once in the shoe, the "too much foot" carefully works its way down to the forward part of the shoe and cramps the toes against the toe box. With the toes cramped, excessive perspiration begins and the fiber soled shoes are given credit for causing the feet to perspire.

A test will suggest a cure for this defect. Fit this same foot to a fiber soled shoe that is a full size longer and a width or more

SOLE OF THIS TYPE WERE SOLD IN THE EARLY DAYS. THEY WOULD EASILY CRACK WHEN BENT

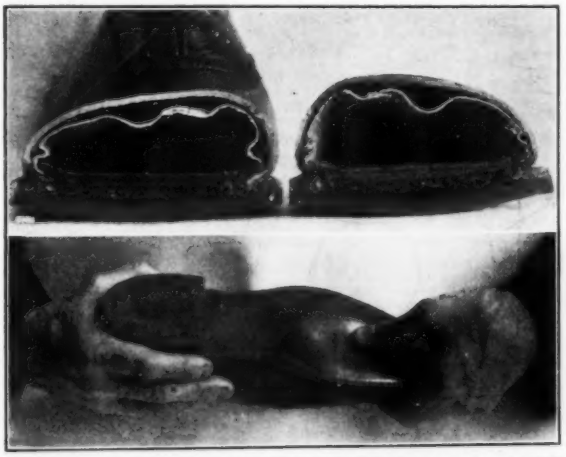
narrower and you will find that the same trouble will not exist or at least in no such objectionable proportions.

WEARING QUALITIES. As far as the actual wearing away of the material is concerned it appears that the fiber soles have an advantage in the ratio of about 1.2 to 1 as compared with leather

as determined from the averages of the 30 pairs of test shoes tabulated under Table II. It cannot be accepted as a fact, however, that fiber soles will always outwear leather since from the same table it can be readily seen that in ten cases, leather outwore fiber and in two cases it equaled it in wear. It is a noticeable fact that when the composition did outwear leather it was in a much higher ratio than in cases where leather outwore fiber.

Since the fiber sole material is a manufactured product its quality can be uniformly maintained. This, however, is not the case with leather. The latter material is made from the skins of animals and is a product of nature. Different parts of the hide vary in such a manner that a sole cut from one location will outwear a sole cut from another location. By these facts perhaps it can be explained why in some cases leather will outwear fiber while in some other cases this is not true.

The reader should bear in mind that of the leather soles tested, they were all supposedly "army specification" leather soles which is the highest priced leather obtainable. Let us apply this same test to civilian leather soles of much inferior selection, quality and much lower price and we shall find that the wear ratio is much more greatly in favor of fiber. The price of the fiber sole will not fluctuate whether it be used in an "army specification" shoe or in a cheap stitchdown for children. Let us take Hemlock, Union and offal soles for our comparison and see what we shall see. The accompanying illustrations give some specific data on this point.



THE SOLE OF THIS SHOE WAS EASILY DEPRESSED, WHICH DISSECTION SHOWED WAS DUE TO POOR SHOEMAKING

SERVICEABILITY. It will be noted in Table I that there are three ways in which fiber soles failed as compared with one way in which leather failed. In 27 out of 40 cases listed, the test had to be discontinued because of the failure of the fiber sole. In some cases, the fiber sole would wear and break off at the toe, permitting an accumulation of dirt under the toe, causing a lump due to the yielding of the fibrous material. This would exert a tension on the stitching which would pull out, causing the sole to become loose. This same effect was produced when a fiber sole cracked or the stitches pulled out in any other place than the toe. Besides causing discomfort to the wearer, it also allowed moisture to penetrate between the outer and middle soles which would not dry out quickly and hence the middle sole (of leather) would swell and become uneven. These objections were not nearly so acute with leather because the soles were stiffer and would not yield as readily. In each of the cases where the fiber soles failed, the leather sole remained in good condition and had considerable wear left. It can readily be seen that the leather was more serviceable than fiber in these tests.

What the Government Concludes

CONCLUSIONS. The following conclusions apply only to the material actually used in this test:

1. That the wear of the fiber soles compared favorably with that of the leather used.
2. That there was little difference between the wearing qualities of the three brands of fiber soles used.
3. That the leather proved more serviceable than the composition.
4. That wearing and breaking off at the toe and the pulling out of stitches are typical ways in which composition soles fail.

To my mind nothing could be more conclusive of the value of fiber soling than this report of the Bureau of Standards. If you will analyze these conclusions you will realize that the greatest fault is not actually with the material but more nearly with the method and care used in applying. Admittedly, the greatest amount of fault found with it can be overcome if they will not stub off at the toe and if the stitches can be made to hold. The structure of the fiber compound can certainly be changed to withstand this stubbing effect and better methods of stitching will certainly accomplish wonders in limiting the breaking of stitches in wear. Breaking of stitches means poor tension in stitching or rather unequal tension in stitching but with the automatic tension devices on our sole stitching machines, properly set and adjusted, any reliable shoe manufacturer should be able to turn out such fiber soled shoes in quantity with little fear from this feature.

The one failure that we cannot condone is that of cracking of the fiber sole. That is inexcusable in a test sole unless it can be conclusively shown that it was caused by poor shoemaking. A fiber sole must be so stitched that it can flex naturally on the shoe and of course, if it cannot, almost anything is likely to happen to it. Soles might crack from this cause but certainly the compound and cure can be controlled so that cracking will not be a prevalent feature.

In the January number Mr. Burnham will offer some constructive suggestions as to what he believes may be done to rehabilitate the fiber sole industry.

STANDARD SPECIFICATIONS FOR GOVERNMENT PURCHASES

An attempt is being made, through the American Engineering Standards Committee, to eliminate the differences between specifications for Government purchases and the usual practices of commercial suppliers. It is believed that this will result in important economies not only to the Government but also to other consumers as well.

Specifications already submitted to the American Engineering Standards Committee by the Federal Specifications Board include hose for various industrial purposes and cotton duck. Other specifications which have been officially adopted by the Federal Specifications Board for the use of all Government departments but which may possibly be revised within a year include the following: pneumatic tires, solid tires, and inner tubes; basic carbonate, white lead, basic sulphate, white lead, leaded zinc oxide, red lead, and zinc oxide.

TEXTILE ASSOCIATION PLANS RESEARCH CONFERENCES

The Research Committee of the National Association of Cotton Manufacturers is considering a plan for holding occasional open conferences in various New England textile centers, with a view to arousing increased interest in the research movement. Among the members of the committee are the following representatives of tire fabric mills: Edward W. Callahan, agent, Fairhaven Mills, and Albert R. Pierce, superintendent, Pierce Manufacturing Corporation, both of New Bedford, Massachusetts, and W. O. Jelleme, Brighton Mills, Passaic, New Jersey.

Colloid Process of Reclaiming Rubber

Plauson's Method of Rubber Regeneration[1]

An interesting method has been added to the well known processes for reclaiming vulcanized waste rubber. This process depends on the discovery that it is possible to obtain regeneration in a simple manner at a low temperature by the simultaneous use of a dispersion agent, a substance of colloidal nature as accelerator of dispersion, a saponifying agent, or a swelling agent or solvent.

The waste rubber is treated with suitable liquid at temperatures between 15 and 120 degrees C. without application of pressure but in an extraordinarily finely divided "dispersed" state. This has the great advantage that the use of high temperature and pressure is avoided, the properties of the raw material are not changed so much as is otherwise the case, and a reclaimed rubber is obtained which has almost the same chemical properties as the initial rubber but its colloidal chemical properties are different. This applies only when the waste rubber used has not been exhaustively vulcanized or subjected to the so-called aftervulcanization at high temperatures for a long time. In that case the reclaimed rubber obtained is to be regarded as a polymer of natural rubber. It is insoluble in the ordinary rubber solvents and its colloidal properties are also different.

The essential feature of the new process consists in applying an extraordinarily intensive mechanical disintegration, in the so-called colloid mill, to a mixture of waste rubber with a large quantity of water and certain added substances which accelerate dispersion or otherwise favorably influence the process. Among such additions are small quantities of soap from fats, resins, naphthenic acid, etc., or their raw materials, or colloids such as glue, starch, dextrine, albumen, casein, resin emulsions, rubber latex and various alkali compounds of a suitable nature to combine with the sulphur extracted.

Various swelling agents or solvents for hard or soft rubber can be employed, such as benzene, aniline, phenol, and oils of various sorts. The treatment results in yielding a homogeneous product resembling rubber latex and may be considered as a colloidal solution of rubber so that the rubber is practically in the hydrosol or organosol form. The rubber thus finely divided can be desulphurized.

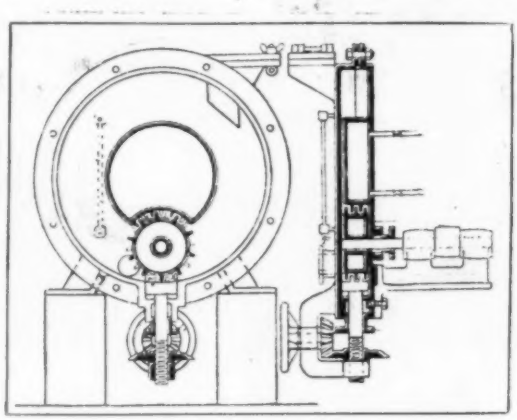
In the operation of this process ten parts of ammonium sulphide, 1 part of caustic alkali and 2 parts of potash soap are dissolved in 100 parts of water. At a temperature of 100 to 110 degrees C, there is then added 10 parts of vulcanized soft rubber, that is, waste rubber from automobile tires, in the crumb or granular form. This mixture is then intensively disintegrated in a colloid mill in which the beater arms run in liquid at as high a speed as 2,000 meters per minute, and is pumped by a mud pump into a reservoir and then continuously circulated between the reservoir and the disintegrator.

It is preferable but not essential to heat the reservoir and liquid by steam to 100 to 110 degrees C. The rubber and liquid form a homogeneous mass even after disintegration for half an hour. After one hour, an emulsion-like appearance is observed and the free sulphur has been extracted and is present partly in the colloidal form and partly dissolved by the ammonium sulphide. Further treatment depends on the final product desired.

The mixture may be cooled by the addition of cold water with continual disintegration, and the major portion of the liquid containing the free sulphur in the colloidal and dissolved form may be removed by filtration and pressure or the sulphur can be extracted from the emulsion with organic sulphur solvents. The rubber mass can be again treated in the same dispersion medium for several hours with fresh addition of alkali when the chemically combined sulphur is partly removed. By increasing the addition of alkali to about 10 parts, almost the whole of the free and combined sulphur can be removed by a single disintegration. By addition of 10 parts of benzene or xylene, etc., and 5 to 10 parts of caustic alkali the extraction of sulphur can be performed without addition of ammonium sulphide.

Vulcanized soft rubber can be highly dispersed in ordinary water without addition of alkali if one of the above mentioned dispersion accelerators, preferably colloids such as colophony, glue, gelatine, casein, protein, etc., is added together with 5 to 10 per cent of one of the hydrocarbons named. The process is, however, always accelerated by the addition of alkalis.

After complete regeneration and washing, a difficultly soluble or insoluble rubber-like mass is obtained which, however, swells in certain hydrocarbons. The phenomenon of insolubility is apparently to be explained in that in ebonite vulcanization a polymerization of the rubber molecule also takes place and the sulphur partly plays the role of catalyst for polymerization and partly



Plauson Colloid Mill

adds itself onto the rubber molecule and in such a form is dissolved by the highly polymerized rubber.

When treating waste which contains textile material, such as automobile tires, these substances must first be removed by treating the finely ground waste at 100 to 110 degrees C. to a 30 per cent alkali solution or a 50 per cent zinc chloride solution in a mill until the fabric has been dissolved.

The colloid process has the advantage that only small quantities of the expensive organic regenerating agents are used, since owing to the high dispersion obtained by the extraordinarily fine mechanical disintegration, the regenerating agent comes into most intimate contact with the highly dispersed rubber. The chemicals employed therefore act rapidly and energetically on the rubber. In prior processes the chemicals came in contact with only the surface of the rubber and did not penetrate deeply enough except under high pressure and temperature. In such cases the outer layers of rubber were partially decomposed by the action of the reagents, the pressure, and the temperature, by the time the reagents reached the interior portions.

The devulcanization takes place at low temperatures; therefore, a catalytic reverse action of the sulphur or sulphur compounds formed does not take place as is possible when regenerating rubber at high pressure and temperature.

[1] United States patent No. 1,432,895.

Molds for Hard Plastics[1]

Current Practice in Mold Design for Hand and Semi-Automatic Molding

Molds for Hard Plastics

Molds for shaping all plastic materials are divided into two general types, the overflow or flash mold, and the positive or plunger form. The properties of the material molded, how it hardens, and how the mold is to be handled in production, all influence mold design.

Accuracy in dimensions of the molded product and the operating conditions of heat and pressure require the use of steel of special grade, usually fine quality, self-hardening tool steel. Such steel has the high tensile strength needed to enable the mold to withstand the heavy strains to which it is subjected in hydraulic press operation and also the quality for die sinking and hubbing with the superior polish necessary to impart the finish required on the molded product.

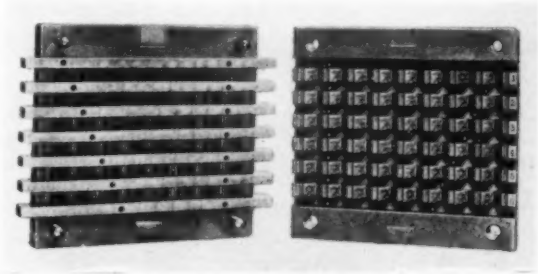


FIG. 1. HAND FLASH MOLD FOR MAKING DICE

Special expert engineering ability is also needed to produce correctly designed molds. In fact, mold designing is a critical feature of the hard plastic business and upon its quality depends the success of the molding operations. This is particularly true of closed or positive molds for complicated pieces and those containing accurately placed metal inserts.

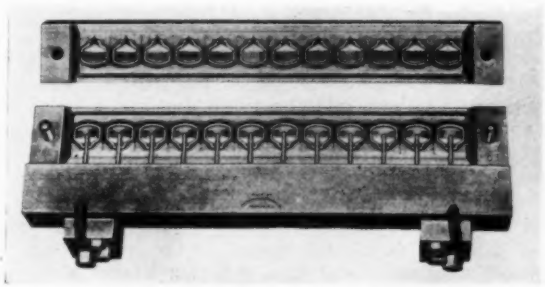


FIG. 2. PRESS FLASH MOLD WITH INSERT BAR

The two types of molds previously referred to are distinguished by the fact that in the overflow or flash mold one part rests upon the other when closed and in the positive or plunger mold one part rests within the other when closed.

Overflow Molds

The overflow or flash mold is adapted for material in plastic masses, or approximate mold form, like rubber or shellac compositions, filling the cavity to excess. When closed under pressure this excess extrudes between the two parts of the mold as a thin fin or flash of waste. In rubber work a shallow recess is usually provided around the mold cavity to receive the flash as a rind.

Variations from simple single cavity hand molds to multiple cavity and semi-automatic molds in both types are an interesting study and make clear some of the elements and problems of mold design. Upon the attainment of correct design the success of hard plastic molding depends.

Single and Multiple Cavity Flash Molds

Single cavity molds are in general more expensive to make and operate than those with multiple cavities. Single cavity molds are used for making phonograph records and for large or complicated pieces with numerous inserts. Fig. 1 represents a simple overflow mold for making dice and Fig. 2 one for making keys with metal inserts. Both molds are indirectly heated from the press. A direct steam-heated mold with connections for mounting in a semi-automatic press is seen in Fig. 3.

When the size and form of the object permit, semi-automatic molds are made with interchangeable impressions attached to top and bottom impression plates. These also serve for attachment of the mold in the press. One cavity of a flash mold of this sort is shown in Fig. 4 as mounted in a press ready for operation.

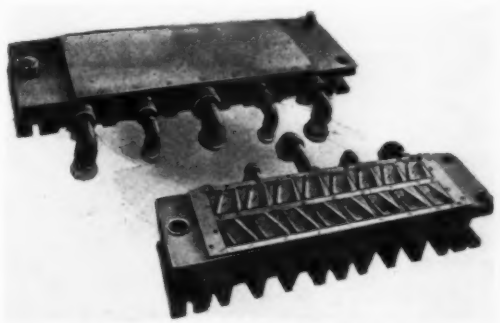


FIG. 3. DIRECT-HEATED FLASH MOLD

The object produced in this mold, shown in Fig. 5 in half cross-section, is a circular knob with knurled edge having a hole of different diameters through the center. This mold requires upper and lower pins meeting in the center to form the hole. The finished object is removed from the lower cavity by the upward action of an ejector pin which passes through the bottom heating plate, striking the shouldered pin in the lower mold cavity and ejecting the knob upward. It will be noticed that the heating plates have tubular passages for steam circulation.

Positive Molds

Closed type molds are usually known as positive or plunger molds. They are built to contain just sufficient material to form the article molded without excess or overflow. Attached to the top or cover portion is the plunger or "force" which serves to compress the stock in the die or impression cavity, closing it against overflow or escape of the molding material.

A typical example of a single cavity positive hand mold and picture of object produced from it are shown in Figs. 6 and 7.

[1] The data and illustrations used in the article were obtained from the Chas. Burroughs Co., Newark, New Jersey, and The General Bakelite Corporation, New York, N. Y.

The mold is of hardened steel in the cavity of which the graduations for the dial are engraved in relief. The force plate carries D is the impression cavity die sunk to correspond to the design required on the molded object; E, the impression plate upon

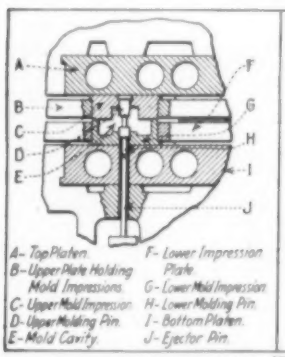


FIG. 4. FLASH MOLD WITH EJECTOR PIN—INDIRECTLY HEATED IN PRESS

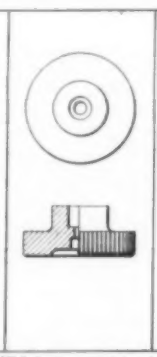


FIG. 5. KNOB MADE BY FIG. 4 MOLD

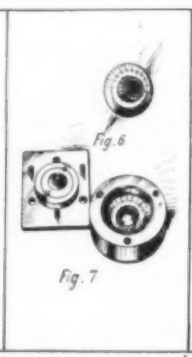


FIG. 6. RADIO DIAL MADE BY FIG. 7 MOLD

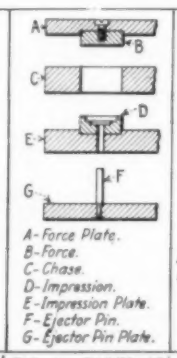


FIG. 8. PARTS OF SEMI-AUTOMATIC POSITIVE MOLD

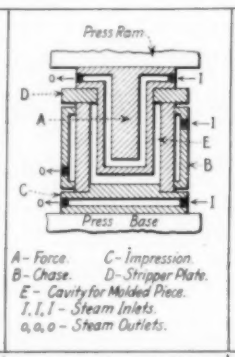


FIG. 9. PARTS OF DIRECT HEATED POSITIVE MOLD

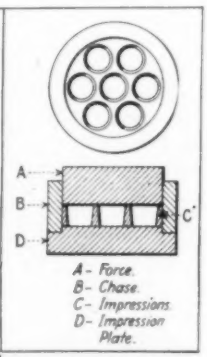


FIG. 10. PARTS OF SUB-CAVITY POSITIVE MOLD

dowels to guide the closure of the upper and lower parts of the mold. The pin in the center of the force is to carry a brass insert molded into the back of the dial.

When the mold is opened the pin or plug seen in the bottom of the die serves as a means of removing the finished piece from the cavity. The three holes through the force plate are used in opening the mold by means of a three-pin hand tool.

Multiple Cavity Positive Molds

Multiple cavity positive molds are built and assembled to facilitate ease of operation. These automatic or semi-automatic features are indicated diagrammatically in Fig. 8. The parts of this assembly are given specific names indicating their functions, as follow: A, force plate to which is attached the respective plunger or "force" for each mold cavity; B, the plunger or

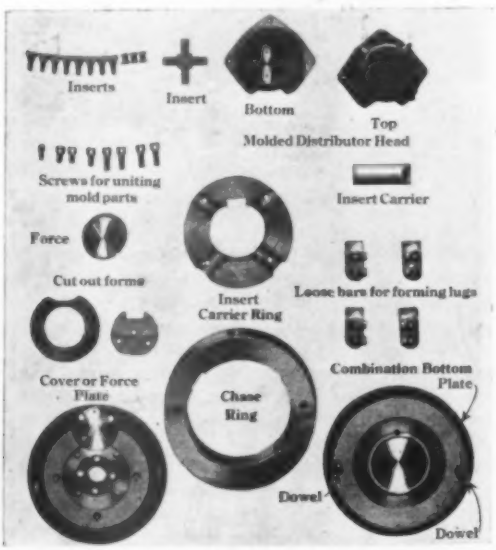


FIG. 11. PARTS OF POSITIVE MOLD, INSERTS AND MOLDED DISTRIBUTOR HEAD

"force"; C, the chase or retaining plate containing cavity for the molding material, sometimes functioning to hold together an assembly of mold parts.

The chase of a mold performs essentially the same function as a printer's chase in holding together a form of type for printing. which are mounted the mold impression pieces central over holes through which ejector pins, F, act to remove the molded piece from the impression cavity; G is the ejector pin plate.

Direct Steam Heated Positive Molds

Hard plastic molds are operated in brief cycles of time owing to the nature of the molding medium. This frequently necessi-

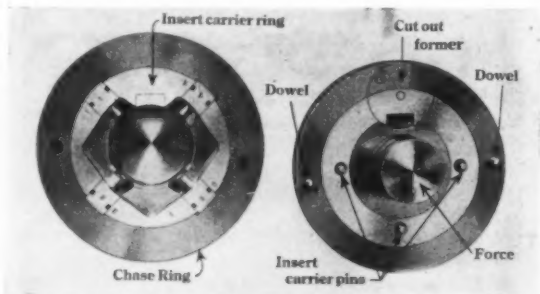


FIG. 12. TOP AND BOTTOM DIE ASSEMBLY OF FIG. 11 MOLD

tates building the mold to provide in its construction for circulation of steam and water alternately through the mold parts.

The construction of a steam-heated positive mold for a deep hollow object is illustrated in Fig. 9. The force A, chase B, and impression C are each cored for independent circulation of steam or water. Because of the depth of the mold and consequent difficulty in withdrawing the force for removal of the object from the chase, a stripper plate D is arranged under the flange of the force A, between it and the top of the chase B.

If the stripper plate is attached to the head of the press the mold is readily opened mechanically. In any event the mold can be more conveniently with than without a stripper plate in the case of deep molds.

Sub-Cavity Positive Molds

Very small objects are frequently made in a so-called sub-cavity mold to secure speed and economy of molding. A diagram of such a mold is shown in Fig. 10 in plan and section. A represents the force, B the chase, C the impressions, and D the impression plate.

Complex Positive Molds for Piece Containing Inserts

The individual parts of a somewhat complex mold with inserts are shown in Fig. 11, together with top and bottom views of the finished piece which is a distributor head for an automobile ignition

system. It is approximately a deep hollow cylinder having a curved cut out on one side and a square base. Examination of the individual mold parts and their assembly, shown in Fig. 12, reveals the necessity of expert design and workmanship for its successful production.

An important requirement in designing positive molds is the provision of sufficient capacity above the cavity for the article to hold sufficient powdered material to form the molded object. This condition does not obtain in an open or overflow mold because the material used in that style of mold is a plastic mass filled into the cavity in excess by hand.

Rubber Trade Inquiries

The inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The Editor is therefore glad to have those interested communicate with him.

(99) A correspondent desires addresses of manufacturers of rubber tissue, such as used by tailors.

(100) Addresses of manufacturers of ground glass, 50 to 70-mesh, are requested.

(101) A foreign correspondent desires addresses of manufacturers of rubber horn bulbs, with view to representation.

(102) Request is made for addresses of American manufacturers of golf ball equipment and molds.

(103) Inquiry is made for addresses of concerns manufacturing rubber paving blocks and for information as to where rubber paving is in use.

(104) A manufacturer requests addresses of manufacturers of corn oil substitute.

(105) Request is made for addresses of manufacturers of guaranteed leather gaskets for hydraulic presses.

(106) A correspondent desires the addresses of manufacturers of rubber rugs.

(107) A patent attorney requests addresses of manufacturers of dies and taps used for threading hard rubber tubing.

(108) A reader desires to obtain addresses of concerns making knives for cutting rubber off rolls on rubber mills.

(109) Request is made for a directory or list of manufacturers of hard rubber tubing and rod stock and those which turn it, with special reference to fountain pen manufacture.

(110) A fabric jobber requests addresses of houses doing proofing.

(111) A reader inquires for sources from which to obtain cement for securing together pieces of hard rubber stock, as sealing plugs in threaded openings.

(112) Inquiry is made for addresses of manufacturers of bicycle pumps.

(113) Inquiry is made as to who owns the trade mark "Chek Tread" on tires.

(114) A request has been received for addresses of manufacturers of machinery for wire winding hose from ½ to 3 inches in diameter, particularly to use up short lengths of wire.

(115) A reader desires the addresses of manufacturers of machines for cutting flat disks from slab stock from ½ to 1 inch thick, ranging from 3 to 10 inches in diameter.

(116) Prices are desired on tan or brown tire putty in bulk in quantities from 25 to 500 pounds or by the gallon; also on cement for use with putty.

(117) An inquirer desires addresses of dealers in cotton or woolen flock.

(118) A Canadian concern desires the addresses of dealers in silicon in the colloidal state.

(119) A manufacturer desires addresses of concerns making small lever-cutting knives.

Foreign Trade Opportunities

Addresses and information concerning the inquiries listed below will be supplied to our readers through the Foreign Trade Bureau of The India Rubber World, 25 West 45th street, New York, N. Y. Request for each address should be on a separate sheet and state number.

(3980) Leather and rubber goods for industrial purposes—Poland. Agency desired. Quote, German or French, c. i. f. Danzig.

(3991) Rubber articles—Poland. Agency desired. Quote c. i. f. Danzig.

(3998) Fishermen's supplies, including rubber boots—Portugal. Purchase. Quote c. i. f. Portuguese ports. Payment against documents on arrival of goods.

(4021) All-rubber patches and cement—Cuba. Exclusive agency.

(4062) Rubber heels—Norway. Agency.

(4067) Men's rubber shoes and raincoats—Chile. Agency. Quote c. i. f. Coronel in Spanish.

(4076) Tires—Italy. Agency. Quote c. i. f. Palermo.

(4077) Tires—Australia. Agency. Cash against documents.

(4084) All kinds of sport shoes—Norway. Purchase. Quote c. i. f. Bergen.

(4157) Tires—Norway. Agency.

(4177) Rubber garden hose, 50-foot lengths, ¾ to 2-inch, plain and wired—Italy. Purchase. Quote c. i. f. Italian port, in Italian or French.

(4217) Electrical installation and telephone materials, insulated cables 1.5 to 100 sq. mm., etc.—Norway. Purchase. Quote c. i. f. Norwegian port.

(4226) Rubber galoshes, 50,000 to 70,000 pairs—Baltic Provinces. Agency and purchase. Quote c. i. f. Baltic port. Cash against documents.

(4229) Motor cars, tires, and accessories—Ireland. Agency. Quote f. o. b. New York.

(4239) Electrical appliances for lighting, telephone, and telegraph services; hospital supplies—Canary Islands. Agency. Quote c. i. f. Santa Cruz de Teneriffe. Cash against documents arrival of merchandise.

(4240) Motor cars, trucks, cycles, tires and accessories—Germany. Purchase and agency. Quote c. i. f. German port.

(4241) Electrical accessories, insulating materials, wires and cables, etc.—Australia. Agency. Quote f. o. b. American port. Cash against documents.

(4244) Sporting goods—Sweden. Agency. Quote c. i. f. Stockholm.

(4256) Pneumatic tires—Belgium. Represent manufacturers.

(4267) Auto accessories, rubber pads, vulcanizing outfits, etc.—Hungary. Agency. Quote c. i. f. Hungary.

(4271) Insulating materials—Norway. Purchase and agency. Quote c. i. f. Norwegian port.

(4289) Stamp canceling machines, hand or foot power, for small postoffices—Mexico. Purchase. Quote in Spanish.

(4301) Rubber flooring—Switzerland. Agency. Quote on 50, 60 or 100 square meters, c. i. f. Hamburg, Amsterdam, or preferably Basel.

(4321) Autos, cycles, accessories, benzine, tires, vulcanizing and retreading outfits, air compressors, etc.—Hungary. Purchase and agency. Quote, German, French, or Hungarian, c. i. f. Hungarian port.

Trade Lists Available

Mimeographed copies available on reference to titles and file numbers.

Hospitals, Ecuador LA–15006
Rubber goods, importers and dealers, Denmark... EUR–2031–A
Electrical apparatus and supplies, importers and dealers, Italy EUR–6021

Scientific Fabric Cutting—II[1]

Computing Waste Percentage—Stock Distribution and Inspection—Ideal Layout

Records of Waste Percentage

IT is now general factory practice to keep accurate records on the percentage of waste in all types of fabric cutting and to offer the operator an incentive to save stock by arranging his patterns to best advantage. Unless this incentive is given, the best results cannot be obtained, no matter how close supervision of the work is maintained. There are various methods of incorporating this incentive with the operator's piece rate.

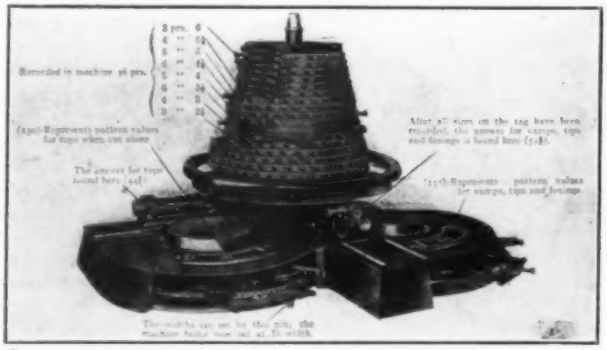
Detailed analysis of all of the various shapes of patterns in use must first be made. For instance, a paper lay-out of a run of sizes of men's gum shoe linings might show the best possible yield to be 9½ pairs per yard, making the scrap percentage 22 per cent. The method would be to set a standard of 25 per cent on this class of work and pay the cutter a bonus of 5 per cent for every per cent below that figure. Changes in patterns must be watched closely, however, as the same pattern might be made more oblong in shape enabling the cutter to cut it at 20 per cent without increasing the yield of pairs per yard which must be the real criterion. In a case like this the standard would be changed to conform to the change in pattern.

Computation of Waste Percentage

There are two methods of computing scrap percentage by weight. The first is to weigh and tag each table of stock issued to the cutter, a record being kept of the weight and serial number of the table. When the table is cut up the cutter turns in the tag, which is checked off on the record of stock issued and entered in the cutter's scrap account; the waste from that table of stock is weighed and entered in the same record, and the percentage figured by dividing the scrap weight by the stock weight. The other method is to weigh the cut pieces and the scrap, add the two together to get the amount of stock used, and divide as before.

In the layout shown in the accompanying diagram each machine is equipped with a scrap chute and scale, so that the waste can be weighed as it is created and returned to the mill room by means of gravity to be reground for rag stock. This eliminates all extra handling and trucking. All scrap chutes are kept locked and are only opened by the scrap weigher who weighs the waste in the presence of the cutter to avoid disputes, makes a record of it, and disposes of it at the same time. The weighing clerk must be a person of integrity in order that the system may be foolproof and prevent the cutters from "beating" the percentage and getting paid for savings they did not make.

The amount of unvulcanized waste reground for rag stock over a given period is a good figure to check against the cutting room scrap report. The table weights can be checked against the weights of stock run in the calender departments. Thus, over a given period the inventory of the cutting room stock department plus the amount of stock received during that period, less the inventory at the end of it, should equal the amount of stock consumed by the cutting machines, with allowance made for doubling and calender waste.



The Krippendorf "Kalculator"

Mechanical Computator

There is another method of computing the efficiency of cutting by means of measurement, eliminating all weighing of stock or waste. This employs a machine which computes accurately and quickly the number of feet or yards of stock it will take to cut a given number of pairs at the best possible performance. To employ this method it is first necessary to send a model size of each pattern used to the laboratory of the machine company where an analysis is made and the factor of this part determined. To operate the machine, which combines the work of a grading machine and comptometer at the same time, the pattern factor or index is set on an indicator for that purpose. Supposing the ticket to be cut is 36 pairs; 3 pairs, size 6; 4 pairs, size 5½; 5 pairs, size 5; 6 pairs, size 4½; 5 pairs, size 4; 6 pairs, size 3½; 4 pairs, size 3; 3 pairs, size 2½. These sizes and pairs are recorded on the cylindrical dial, the width, A, B, C, D, is set on the scale near the base of the machine, and the answer is found in the center—5¾ square feet.

As all pairs on the cutter's ticket are computed in cuts, under this system the cutter's instructions would read 50 cuts of a run of sizes on a certain set of patterns, best performance 5 running yards of stock. Then a bonus would be paid for attaining close to this performance. The actual performance would be checked by a scrap clerk equipped with a yard stick instead of a pair of scales, and the work would be much simplified. These figures would also form a very accurate method of computing the amount of stock needed for a given ticket by the planning department.

Cut Stock Distribution

After the parts of the various shoes are cut, the work is counted out piece by piece and marked with the number of the maker who is to receive it. A ticket of 20,000 pairs of shoes per day means the counting of nearly 600,000 pieces of work by a group of workers, usually women, skilled in the art of "picking."

Some factories segregate this work in a department known as the "postoffice," where the work is counted out, and the surplus parts kept in racks to fill extra orders due to shortages, spoilage, etc. Experience has shown, however, that better results are obtained if this work is done adjacent to the machines, the surplus parts being kept in neat order on top of the bench so that the cutter can make deductions immediately. If the dies are made with code size nicks, little trouble is experienced with mixed or unsorted work.

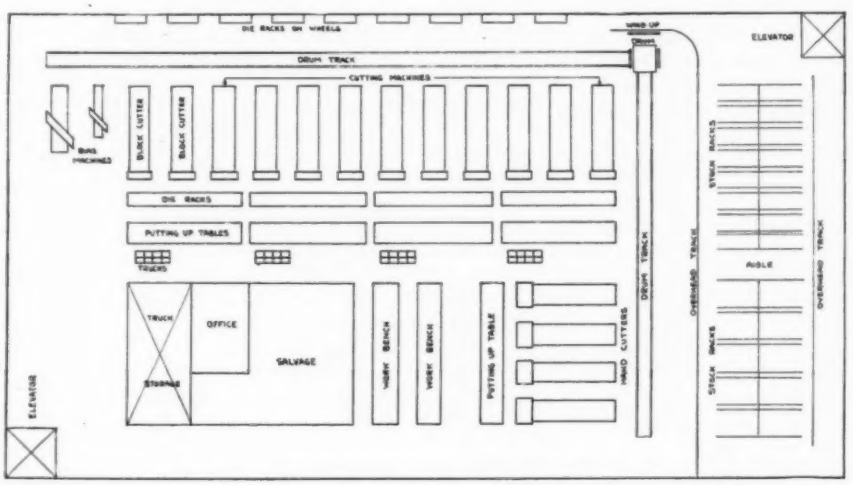
All sets of parts should be checked as they leave the cutting department as a precaution against large shortages which would handicap making the production. Small shortages due to wrinkled parts, spoilage in cementing, etc., are unavoidable, and must be made up immediately on orders from the making departments.

[1] Continued from THE INDIA RUBBER WORLD, November 1, 1922, pages 83-85.

The usual method is to schedule these orders as early as possible in the day.

Inspection and Supervision

Inspection in the cutting department covers a wide range of duties. The care of dies is very important as when they become bent, warped, or broken, imperfect parts which will not fit are the result. Certain classes of work must be cut with a certain stretch of the stock which may cause a higher scrap percentage in cutting but is absolutely essential to the quality of the shoe. Wrong material is very apt to be used where there are so many stocks of similar nature, and must be guarded against.



Ideal Department Layout for Scientific Fabric Cutting

Due to the large volume of production which passes through it and the number of small units, the cutting department is more liable to accumulate surplus material which if not guarded against becomes obsolete and unusable. Thus a foreman is needed who has vision enough to realize that while production is first, quality and scrap come close behind it.

The usual method of supervision in this department is to have a general foreman in charge of upper, outsole, and fabric cutting, with each subdepartment in charge of assistants who are in reality specialists in their line of work. These specialists are usually men who have worked on the bench and have shown executive ability enough to be promoted.

Ideal Department Layout

Adjacent to the putting up tables shown in the diagram there is aisle space for trucks that convey the sets of work to the cement and making departments. These trucks are divided into compartments for different classes of work, to simplify distribution of them. Two bias-cutting machines are used for cutting bias strips. This machine is similar to the larger bias shear used for cutting tire fabrics, and as nearly every type of shoe made takes a bias strip of either friction or coated stock, a large ticket must be handled by these machines.

Storage of dies is quite important because if adequate space is not provided, they will be piled one on top of another, and their edges nicked and dulled until they are unfit for use. Two sets are provided: one in a series of shelves beneath the benches at the head of the machines, for dies which are in constant use; the other in sets of movable racks stored next to the wall.

The foreman's office and salvage cage are located convenient to the work. Where so many small parts become damaged or necessitate rehandling there is need for a salvage station. This unit performs the service of cutting small parts out of damaged larger ones, keeping obsolete stocks and parts cleaned up, and serves as headquarters for the weighing clerks and their records on cutting performances. It is a most important department.

It will be noted that there is very little lost motion in this layout. The rolls of stock are conveyed up the elevator in one corner, pass directly to the racks, are tabled off on the drum, cut up at the machines; the parts picked, put up, checked, placed in the trucks, and carried to the next department via the elevator in the farther corner without any deviation whatever.

The cutting department for a tire factory may be laid out along similar lines, with bias cutting machines in place of clickers and beam cutters, and book racks instead of benches for "picking" small parts. Scrap chutes would be unnecessary as the cutting waste is very small, not exceeding one per cent.

Some Fundamental Characteristics of Present-Day Buses[1]

By R. E. Plimpton

Regarding tire equipment the author states that pneumatic tires are almost universal on the small buses, but on the heavier types the large single pneumatic tires have the disadvantage of throwing the body high up into the air. This is being overcome by the application of dual tires on the rear wheels, which permits the use of six tires of the same size. The development of the "doughnut" design will help here, provided the brake diameters can be decreased to correspond.

Many operators in the cities are using solid or cushion tires, mounted on a resilient rim or cushion wheel. This combination seems to work out satisfactorily on fairly good pavements, although it has proved too heavy for the rear-axle mechanism on certain buses working over rough roads.

Specifications relating to equipment of typical city buses follow, the first two buses being double-decked, the others single-decked:

[1] Journal of the S. A. E. August, 1922.

SPECIFICATIONS OF TYPICAL BUS EQUIPMENT

Unit	London General Omnibus Co., Type S	Fifth Avenue Coach Co., Type L	Imperial	Fifth Avenue Coach Co., Type J	Mack	Republic	White	Duplex	Fageol
Number of Seats	54	51	30	25	25	25	25	23	20
Front Tires	Solid, 41, 30x4. 73	Solid, 34x5	Cushion 36x6	Cushion, 34x4	Cushion, 34x5	Cushion, 34x4	Solid, 36x4	Pneumatic, 35x5	Pneumatic 36x6
Rear Tires	Dual Solid, 41. 30x4. 70	Dual Solid, 34x5	Dual Cushion, 36x6	Cushion, 34x6	Dual Cushion, 34x5	Cushion, 34x8	Solid, 36x7	Pneumatic, 38x7	Pneumatic, 36x6

Resistance to Tear

By John B. Tuttle[1]

WHILE rubber has very great extensibility, it is well known that the maximum tensile strength and elongation are obtained only when the test piece is ruptured straight across without the influence of tearing. Small pieces of grit, a flaw in the stock—these and other defects readily induce tearing, with consequent low results in the measurement of the mechanical properties. At times, the measurement of tear, or preferably, resistance to tear, becomes a matter of special interest, such as in the case of inner tubes. A rough test has been made by cutting a strip of rubber, making a "nick" in it, and stretching until the rubber pulled apart. By this means, large differences between two stocks could be noted, but the test was worthless for purposes of record, because of the large errors involved.

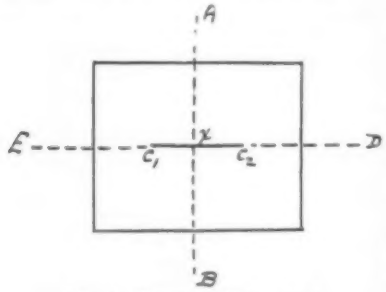


Fig. 1. Constant Stress Test

At the meeting of the rubber division of the American Chemical Society in Pittsburgh, September 5-8, 1922, Zimmerman proposed a method for determining mathematically the resistance to tear, expressing his results in terms of work, calculated to a uniform basis of inch-pounds per square inch. The writer has been interested in this subject for some time, not so much from the point of view of work required to tear a definite area of rubber, but rather in terms of elongation.

A study of the crude method described above soon showed that resistance to tear could be subdivided into two classes:

(1) Where the tear was subjected to practically constant stress.

(2) Where the tear was being made at a constantly increasing elongation.

Zimmerman's test is an excellent example of the first class, in which the stress is exerted along the axis A-B, the tearing taking place at C_1 and C_2 along the axis D-E. See Fig. 1. The tearing, it will be observed, takes place at the junction of the two axes, X, the tear being at right angles to the stress. As the rubber tears along the axis A-B, the tearing taking place at A-B. From this, it will be seen that given an absolutely uniform structure, the forces necessary to effect continual tearing should be practically a straight line.

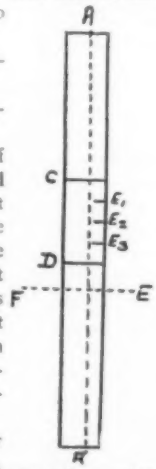


Fig. 2. Increasing Elongation Test

The test which the writer has been using for some time, is an example of the second class. See Fig. 2. It is made as follows:

Cut a strip of rubber 0.5-inch wide and about 5 inches long. Mark two lines, C and D, 1 inch apart. At E_1, E_2, E_3 (each ¼-inch apart) cut slits about one-third the way across the test piece. Insert the ends in the clamps of an ordinary testing machine, separate the clamps in the direction A-B at a uniform rate of 20 inches per minute, until one of the slits tears completely across. Note the elongation at break. The resistance to tear is taken as the increase in length of the distance C-D at the break.

[1] Consulting chemist, 68 Bank street, New York, N. Y.

It is important that the test piece be firmly held in the clamps across the full width of the test piece. Assuming that this is the case, it will be seen that as the tear proceeds from E_1, E_2, E_3, in the direction of E-F, it meets with rubber under a constantly increasing elongation.

The type of tearing shown in Fig. 1 is the one corresponding to ordinary abrasive wear, as in the treads of tires, etc. There would seem to be considerable relation between this type of resistance to tearing, and resistance to wear, and a comparison of results on a series of tests on various types of compounds should prove exceedingly valuable. The type of tear seen in Fig. 2 corresponds to a bursting tear, as in the case of inner tubes, etc., in which, as the tear proceeds, it finds itself opposed by rubber under tension.

Table 1 gives some very interesting results, obtained on a number of commercial samples of inner tubes. All tear tests given are the average of at least three tests.

Table No. 1

RESISTANCE-TO-TEAR TESTS IN INNER TUBES

No.	Tensile	Elongation Per cent	Sp. G.	Tear Per cent	Description of sample
1	1550	700	1.19	170	Compounded gray
2	1900	800	1.15	140	Compounded gray
3	2260	800	1.18	175	Compounded gray
4	2075	800	1.10	100	Antimony red
5	1950	875	1.06	125	Antimony red
6	2450	825	1.11	300	Antimony red
7	2850	875	0.98	700	Iron oxide red
8	1975	850	1.26	325	Antimony red
9	2300	825	0.99	480	Pure gum gray

It is obvious that this test is susceptible to grain in the calendered sheet, the effect apparently being more noticeable in the compounded tubes than in the pure gum. By "parallel," we understand that the test is made in the direction in which the sheet has been calendered; "transverse" is at right angles to the calender direction.

Sample No. 10; an antimony red, tensile strength 1,800 pounds, elongation 825 per cent, specific gravity 1.25.

Sample No. 11; practically floating stock, gray color, tensile strength 2,350 pounds, elongation 825 per cent, specific gravity 1.00.

Table No. 2

EFFECT OF GRAIN ON RESISTANCE TO TEAR

	Sample No. 10		Sample No. 11	
	Parallel Per cent	Transverse Per cent	Parallel Per cent	Transverse Per cent
	250	180	550	570
	260	200	600	600
	280	220	575	580
	...	220	...	...
Average per cent..	260	210	575	580

It is quite evident from the results given in these two tables, that the resistance to tear is independent of the ultimate elongation, tensile strength, color, or degree of compounding (specific gravity). In a few tests made, it seemed to vary with the cure, and it was thought that such a method might be useful in indicating the best cure of a compound, but, so far, the results have not been sufficiently satisfactory to do more than hint at this possible application of the test.

Summary

A new method for testing resistance to tear is given, being particularly applicable to the testing of inner tubes, balloons, etc. The results are expressed in percentage increase in elongation at break, and the resistance to tear is shown to be independent of the other ordinarily determined physical properties of rubber compounds.

What the Rubber Chemists Are Doing

Studies in Rubber Vulcanization[1]

By Norman A. Shepard and Stanley Krall[2]

Relation Between Chemical and Physical State of Cure

It appears from a review of the literature on the relative merits of the stress-strain relations and coefficient of vulcanization as measures of state of cure that there is considerable confusion concerning the term "state of cure."

It is the opinion of the writers that to cure two samples of rubber to the same *chemical* state of cure is one thing, while to vulcanize to equivalent *physical* state of cure may be quite another. The *physical* state of cure is vital for the performance of vulcanized rubber in service, provided of course that the stability of the physical condition is certain. It is here that the *chemical* state of cure unquestionably plays a major part. It would appear, from what has already been published, that only under standardized conditions of mixing, curing, and testing is there a close relationship between the *chemical* and *physical* states of cure.

In order to throw further light upon the relation between the chemical and physical state of cure in the case of accelerated stocks the writers investigated the behavior of hexamethylene tetramine, paranitroso dimethylaniline, aldehyde ammonia, and thiocarbanilide, when introduced in such quantities that equivalent physical states of cure are obtained when cured for the same length of time at the same temperature. In this way each stock was subjected to identical heat conditions which, by the work of previous investigators, appears to be of paramount importance if a fair comparison of stress-strain data and vulcanization coefficients is to be made. In matching the physical states of cure of these stocks, no attempt was made to work with the so-called "optimum cure." The cure selected was somewhat below that of maximum tensile strength and was judged to be a good commercial cure.

Test Compounds

A selected batch of massed first latex crêpe was used throughout the work and the mixing consisted of 48 parts of rubber, 48 parts of zinc oxide, and 3 parts of sulphur, to which was added the required amount of accelerator necessary to give, when cured for 60 minutes at 287 degrees F., a vulcanizate having stress-strain relations which would match those produced by using 0.5 part of hexamethylene tetramine.

This compound was selected for two reasons: (1) It was essential to work in the presence of zinc oxide in order to bring out the full activity of at least two of the accelerators, and (2) for comparison of the results with certain actual compounds used in factory practice, it was desired to use a somewhat highly compounded stock.

The organic accelerators were all carefully tested for purity.

LIST OF COMPOUNDS INVESTIGATED

	Control A	B	C	D	E	F	G	H	I
First latex crêpe	48	48	48	48	48	48	48	48	48
Zinc oxide	48	48	48	48	48	48	48	48	48
Sulphur	3	3	3	3	3	3	3	3	3
Hexamethylene tetramine	0.5	..	..	..	..	..	..	..	..
Aldehyde ammonia	..	0.5	..	..	0.7	..	..	0.75	..
Thiocarbanilide	..	..	1.0	..	..	1.25	..	..	1.5
Paranitroso dimethylaniline	..	..	..	0.22	..	..	0.25	..	..

[1] Presented before the Rubber Division at the meeting of the American Chemical Society, Birmingham, Alabama, April 3 to 7, 1922. Published in full in The Journal of Industrial and Engineering Chemistry, October, 1922, 951-956.

[2] Research Laboratories, The Firestone Tire & Rubber Co., Akron, Ohio.

Results

For accelerated stocks, even when the quantity of accelerator is so chosen that equivalent stress-strain relations are obtained in the same time of cure, the vulcanization coefficients show no corresponding uniformity. This lack of uniformity in the coefficients cannot be ascribed to sulphur retained in chemical combination by the respective accelerators. In other words, the vulcanization coefficient of an accelerated stock is no criterion of the physical state of cure. It is interesting in this connection to note the comments of Twiss[3].

CHEMICAL ACTION OF SULPHUR

"The chemical action of sulphur on the rubber induces the physical alterations which constitute the advantage to be gained by vulcanization, but the chemical and physical processes are not necessarily strictly proportionate and some accelerators influence one more than the other. In the presence of certain accelerators the physical or mechanical alteration is disproportionately rapid, and the tensile strength attains its maximum at a coefficient of vulcanization well below the normal value."

Certain of the coefficients recorded are all remarkably low. Other investigators have recorded similar results[4]. Kelly has given figures for a thiocarbanilide stock, having a combined sulphur content of only 0.84 and a coefficient of 0.99; the physical properties of this stock, however, are not recorded. Cranor found a stock to have satisfactory physical properties with a vulcanization coefficient of 1.09; he was working, however, with the very active dimethylammonium dimethyl-dithiocarbamate, and the curing time was only 3 minutes.

SPECIFIC ACTION OF ACCELERATORS

The results also indicate that an accelerator has a specific action in vulcanization, aside from its influence on the chemical combination between rubber and sulphur. Many of the published figures on the properties of accelerated stocks show abnormally high tensile properties for low coefficients of vulcanization. However, in most cases, it is difficult to draw any conclusion as to any specific effect of the accelerator on the vulcanization process, since the duration of the curing period has been so variable. Many have ascribed these abnormal properties entirely to the shortening of the curing period through the influence of the accelerator. By the tabulation of Gottlob's results obtained with Vulkazit, Seidl has shown that the shorter the time of vulcanization, the higher the tensile strength corresponding to a definite combined sulphur content. Seidl states that, parallel with the strengthening of the rubber through the taking up of sulphur, a depolymerization of the rubber takes place under the influence of the heat which exerts its harmful effect to a lesser extent, the shorter the time of heating.

PRACTICAL APPLICATION

Aside from a theoretical interest, the results recorded in the present paper have a practical application, since for several commercially applicable accelerators, the quantities necessary for the production of equivalent *physical* states of cure have been derived. The problem of matching the physical properties of a stock in the presence of different accelerators, but under identical temperature conditions and duration of curing period, is one often confronting the rubber technologist, for shortening of the period of cure is far from the only consideration in connection with organic accelera-

[3] Journal of the Society of Chemical Industry, 1920, 39, 125 T.

[4] Cranor. THE INDIA RUBBER WORLD, 1919, 61, 137; Whitby and Smith paper presented before the Section of Rubber Chemistry at the 62nd meeting of the American Chemical Society, New York, N. Y., September 6 to 10, 1921; Kelly, The Journal of Industrial and Engineering Chemistry, 1922, 14, 196.

tors. Toxicity, volatility, miscibility, effect on range of cure, influence on aging properties, and tendency to produce "scorching," all have an important bearing in the selection of accelerators for specific purposes.

Furthermore, where a given stock, of definite stress-strain relations, has proved through years of experience in service its applicability for a specific purpose, the introduction of a new accelerator should not disturb these stress-strain relations unless exhaustive practical tests have proved the desirability of making such a change in these factors. Hence the value, in making comparative studies of accelerators, of matching physical "state of cure" and studying the relative behavior of stocks which contain *equivalent accelerating quantities* of accelerator.

The equivalent quantities which have been determined in the course of this work indicate that 1 part of hexamethylene tetramine is equivalent in accelerating power to 1.5 parts of aldehyde ammonia, 3 parts of thiocarbanilide, and 0.5 part of paranitroso dimethylaniline, respectively, *in the type of stock here tested.* It does not follow, for example, that these exact relationships will hold for a stock in which the sulphur content is sharply reduced. As Twiss[2] has remarked, "the possibility must always be borne in mind that the activity of an accelerator may possibly be influenced by the proportion of free sulphur simultaneously present." Recent publications on the mechanism of the action of organic accelerators[3] would indicate that the concentration of sulphur is an important factor in their activation. Furthermore, it must not be understood that these equivalent quantities have been worked out to the limit of accuracy. Averaged stress-strain data indicate that the errors in curing and testing run upwards to 5 per cent, while the deviations of the three 60-minute stress-strain curves from the control (the 60-minute hexamethylene tetramine curve) average 7 per cent. Further refinements of the equivalent quantities, though desirable from a theoretical standpoint, have not yet been made; from the standpoint of practical application, the above results are sufficiently accurate.

[2] Bedford and Sebrell, The Journal of Industrial and Engineering Chemistry, 1921, 13, 1034; Bruni and Romani, The India-Rubber Journal, 1921, 62, 63.

Studies in Vulcanization[1]

Some Further Effects of Acceleration on the Rubber Stress-Strain Curve

By P. Schidrowitz and P. L. Bean

In a previous paper[2], the effect of an active organic accelerator on the vulcanization properties of rubber-sulphur mixings in the presence of zinc oxide was dealt with. A section of this paper dealt particularly with the effect of varying the amount of the accelerator, using a constant proportion of sulphur to rubber. The present communication deals with the reverse conditions, the proportion of accelerator to rubber being kept constant, with varying amounts of sulphur.

The accelerator employed, as before, was piperidyl dithiocarbamate of piperidine, dispersed on colloidal clay, the proportion of the organic compound being 25 per cent.

The rubber used throughout was the same batch of a standard thin pale crepe. The base mixing consisted of rubber 100, zinc oxide 2½, accelerator 0.5, colloidal clay 1.5, and on this basis six mixings were made up, the amount of sulphur added varying from 1 to 4 parts. The mixings were made in the usual way on open rolls, the accelerator being added last, mixed with the zinc oxide, the temperature of the rolls being kept as low as possible. The times of cure varied from 1 to 40 minutes.

Summary

In all cases combination is comparatively rapid in the early stages.

"Reversion" occurs at a comparatively early period when the quantity of sulphur does not exceed 2½ per cent.

Moderate curing takes place with a sulphur content of 2½ per cent, but below this results are poor.

The accelerator used requires 2 to 2.75 per cent of sulphur, allowing for variations in materials and conditions, to attain reasonably full activity.

[1] Journal of the Society of Chemical Industry, September 30, 1922, 324 T.
[2] Journal of the Society of Chemical Industry, 1921, 268 T.

Maconite

A new dielectric known as Maconite is being manufactured in England on a commercial scale for general insulation purposes and cable insulation. Maconite possesses some remarkable properties not previously found in combination in any one substance. It is a scientific blend of specially selected materials after years of experiment and research. In appearance it resembles black rubber. Its toughness varies from that of ordinary rubber insulation to approximately that of rubber for cable sheathing.

Maconite is non-hygroscopic and successfully resists the action of acids, alkalies and corrosive gases. While its measurable insulating effect is lower than that of some vulcanized rubbers, this insulation resistance is not affected by prolonged immersion in water or even a saturated solution of caustic soda.

Carbon Black

A new method[1] for the production of carbon or lamp black makes it possible largely to increase the yield now obtained in the combustion of a hydrocarbon gas and also to effect an improvement in fineness or covering power by causing the combustion to take place in a dilute gaseous solution of hydrocarbon and oxygen. A diluting inert gas is mixed both with the natural gas and with the air, in order to insure a homogeneous atmosphere in which the combustion takes place.

One of the principal advantages of this process is flexibility in control of plant operations, making it possible either to secure a much larger yield of black of a quality equal to that at present obtained without sacrificing the yield or to combine these advantages.

[1] United States patent No. 1,418,811, Warren K. Lewis, assignor to The Goodyear Tire & Rubber Co., Akron, Ohio.

Chemical Patents

The United States

PLASTIC BINDING AND WATERPROOFING MATERIAL. A natural vulcanizable gum is combined with a sufficient quantity of cellulose xanthate to furnish the necessary amount of sulphur for vulcanization of the desired product. Other filling material includes both organic and inorganic.—Herman E. Brown, Kingston, New York, and Jordan H. Stover, Nutley, New Jersey, assignors to Sona Corporation, New York, N. Y. United States patent No. 1,431,455.

SURFACE COATING COMPOSITION. A composition comprising cumarone resin, petroleum spirit, and from ½ to 3 per cent of rubber.—Albert C. Holtzapfel, New York, N. Y. United States patent No. 1,431,801. Original application divided.

WATERPROOFING AND GASPROOFING COMPOSITION. A composition comprising acetate of cellulose and caoutchouc in a suitable solvent for each, a substance for rendering the acetate of cellulose plastic, and sulphur.—Jacques Daniel Sée, assignor to Société Anonyme des Etablissements Hutchinson, both of Paris, France. United States patent No. 1,431,845.

SEPARATOR FOR STORAGE BATTERIES. A fabric made of rubber composition traversed by strands of mammalian hair from which the scaly exterior portions have been removed.—William H. Wood, Cleveland, Ohio. United States patent No. 1,432,939.

VULCANIZING RUBBER. A process for treating rubber or similar material which comprises adding thereto a rubber compound containing oxygen and inducing vulcanization to take place under its influence.—Iwan Ostromislensky, Riga, Russia, by mesne assignments to New York Belting & Packing Co., New York, N. Y. United States patent No. 1,433,093. Original application divided.

COMPOUNDING AND VULCANIZING RUBBER. A process of treating rubber or rubber-like materials comprising mixing therewith a material activated while in the form of a substantially dry powder and vulcanizing the mixture.—Reed P. Rose, New York, N. Y., assignor to Morgan & Wright, a Michigan corporation. United States patent No. 1,433,099.

The Dominion of Canada

BOTTLE STOPPER. Porous wood treated to render it resilient and moisture proof by impregnation with a solution of liquefied rubber and beeswax within a vacuum.—George F. Rowe, Seattle, Washington. Canadian patent No. 224,455.

BINDING COMPOSITION. A binding composition which comprises comminuted asbestos and sulphur and a binder composed of a preheated mixture of coal tar pitch, stearine pitch, an asphaltic body and an oil capable of vulcanization or polymerization mixed with a volatile solvent. Such mixture is subjected to a quick molding operation at ordinary temperatures, finally subjecting the molded product to prolonged heat treatment after removal from the mold.—The Cutler-Hammer Manufacturing Co., assignee of Clarence A. Nash, both of Milwaukee, Wisconsin. Canadian patent No. 224,821.

The United Kingdom

FIREPROOFING RUBBER COMPOSITION. Rubber compositions are rendered less inflammable by an admixture of casein and hydrated aluminum oxide preferably with the addition of a small proportion of antimony trichloride.—H. Frood and H. P. Alger, Sovereign Mills, Chapel-en-le Frith, Derbyshire. British patent No. 183,922.

PAVING BLOCKS. Paving blocks are formed of a composition consisting of coir fiber either alone or in combination with other fiber and impregnated or combined with rubber, gutta percha, or other adhesive material.—Coir Tyre Co., Ltd., and G. D. Rose, 56A Mosley street, Manchester. British patent No. 183,955.

PLASTIC COMPOSITION. A cellulose product termed hydra-oxycellulose is prepared and substitutes for ebonite, horn, ivory, etc., are obtained according to the material added.—C. C. L. G. Budde, 9 Bedford Terrace, Sunderland. British patent No. 184,610.

PRINTING ON COATED FABRICS. Fabrics coated with adhesive material other than rubber are dusted with mica and hardened by drying. The mica may be incorporated in the adhesive or by printing on the coated fabric mica suspended in rubber, resin or oil.—L. Minton, Trevelyan Buildings, Corporation street, Manchester. British patent No. 184,845.

PHENOL-ALDEHYDE CONDENSATION PRODUCTS.—Lorival Mfg. Co., Ltd., and A. A. Drummond, Norwood Works, Southall, Middlesex. British patent No. 184,961.

PHENOL-FORMALDEHYDE RESINS.—A. Heinemann, 23 Dorfstrasse, Templehof, Berlin. British patent No. 184,984.

HOLLOW RUBBER ARTICLES. Hollow rubber articles, particularly tennis balls, are vulcanized in a mold and at the same time inflated by nitrogen gas liberated from a mixture of 0.7-gram of sodium nitrate and 0.532-gram of ammonium chloride. The gas producing materials may be introduced in solid form or in solution, or mixed with agar-agar, etc. This latter method has the advantage that a gummy protective coating is formed within the ball. Other gas producing substances are specified.—Revere Rubber Co., 59 Reade street, assignee of W. A. Gibbons, 561 West 58th street, both in New York City, U. S. A. British patent No. 185,089. (Not yet accepted.)

PUNCTURE SEALING COMPOSITION. A puncture sealing composition consisting of concentrated sulphite cellulose liquor of about 30 to 40 degrees Baumé, freed from lime and iron, a binding agent of gum, and an earthy constituent like talc.—H. H. Warmund, 5 Hertzstrasse, Charlottenburg, Berlin. British patent No. 185,114. (Not yet accepted.)

TIRE CORE. A composition for tire cores consists of rubber, sulphur, resin oil and clippings of vulcanized rubber sponge waste, or a mixing adapted to produce sponge on vulcanization which is molded and vulcanized as usual.—A. Mallaby, 8 St. Paul's Road, Manningham, Bradford, Yorkshire. British patent No. 185,240.

New Zealand

LEATHER SUBSTITUTE. A binding material of a solution of rubber, factice or vulcanized oils in boiled linseed oil together with a suitable adhesive. A plastic mass is made with this solution, while hot, with shredded leather, ground cork, or teazeled fiber in such proportions that the mixture forms a plastic mass, which can be molded into desired shape under heavy pressure.—Compressed Leather Co., 225 Fitzroy Street, Fitzroy, assignee of G. A. Ampt, Canterbury, both in Victoria. New Zealand patent No. 48,119.

Germany

Patents Issued, with Dates of Issue

363,917 (March 13, 1919) Method of making insoluble and non-melting insulating masses. Felten & Guilleaume Carlswerk Aktien-Gesellschaft, Köln-Mülheim.

364,738 (March 16, 1919) Method of making a plastic mass and of filling in tires therewith. Reinhold Gollert, Kniephofstrasse 48, Berlin-Steglitz. (Addition to patent 305,197.)

364,844 (September 2, 1917) Method of regenerating old rubber and rubber goods. Dr. Gustav Bonwitt, Clausewitzstrasse 3, Charlottenburg.

ERINOID

Erinoid is the name given to British-made galalith. It is a non-inflammable, non-conducting, and odorless casein product readily machined, glued or dyed. It takes a brilliant polish and to some extent it can be bent and molded into articles of simple designs and easy curves such as buttons, shallow trays, etc. It is furnished in the form of sheets and rods.

CHEMICAL EQUIPMENT ASSOCIATION ORGANIZED

During the recent Chemical Exposition held at Pittsburgh, Pennsylvania, an organization known as the Chemical Equipment Association was formed, with headquarters in New York City. The aims of this new organization are chiefly to encourage equipment standardization, to investigate conditions at present prevailing in the industry, and to disseminate information along chemical lines. J. George Lehman, of The Bethlehem Foundry & Machine Co., Bethlehem, Pennsylvania, is chairman of this new association.

CLAY FOR RUBBER COMPOUNDING

Clay is proving very suitable as a compounding ingredient in many lines of rubber goods, particularly where abrasive wear is an important requirement. The reason is found in the degree of fineness, uniformity of quality and freedom from foreign material and pigment characteristic of carefully prepared clay.

These and the property of holding tenaciously to rubber by reason of its specific adsorptive power have brought specially prepared clay into active competition with both zinc oxide and carbon black, particularly in the preparation of tire tread stock where it may be employed to advantage in displacing equal volumes of either zinc oxide or black.

Tensile Testing Machine Draws Stress-Strain Curves

By Harlan A. Depew

At the September meeting of the Rubber Division of the American Chemical Society there was much interest in the type of testing machine most suitable for general use. Practically all those present were interested in stress-strain curves, and most of them obtained such curves by determining a number of points on the curve through the cooperation of two operators.

The Research Division of the New Jersey Zinc Co. has used the autographic testing machine, shown herewith, in recording stress-strain curves. If need be the machine can be operated successfully by boys 16 to 18 years of age. The attention of the Rubber Division of the American Chemical Society was called to this at the September meeting. Since that time C. J. Burkley has published an article[1] on jump-spark method of recording the stress-strain curve.

The method of operation of the machine is shown in Fig. 1. The curve paper is placed on the drum A. This is geared so that it turns uniformly with the applied load. The operator follows the marks on the test piece by turning the two knobs B. These raise and lower the pen C so that the vertical distance of the pen is always equal to the distance between the marks on the test piece. The machine can be changed very easily so that the elongation axis is the abscissa if the operator desires.

Fig. 1. Drawing Stress-Strain Curve Autographically

The practice is to break three test pieces from each test slab. A curve is drawn for the first break as in Fig. 2. The load and elongation are read from the test machine directly, as follows:

Test Pieces No.	Thickness inches	Width inches	Per Cent Elongation	Average Per Cent Elongation	Tensile Strength lbs.	Tensile Strength lbs. per sq. in.	Average Tensile Strength lbs. per sq. in.
1	.178	.25	594	...	143.3	3220	....
2	.171	.25	619	...	140.7	3290	....
3	.172	.25	619	610	137.8	3220	3240

The area is now determined between the curve and the elongation axis by means of a planimeter. This is found to be 9.46 square inches[2]. Since this area is dependent on the thickness of the test piece, it must be corrected to a definite thickness. A test piece with a thickness of 0.133 inches will give a curve such that one inch on the abscissa will correspond to 600 lbs. per sq. in. A standard thickness of 0.133-inch is arbitrarily chosen, and

[1] The India Rubber World, October 1, 1922, 24.
[2] 1 inch ordinate = 150 per cent elongation; 1 inch abscissa = 20 pounds.

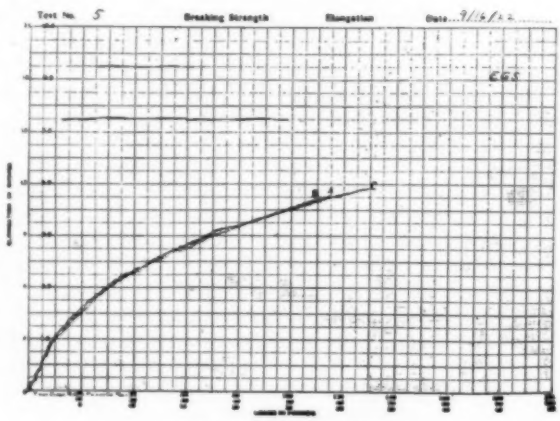


Fig. 2. Stress-Strain Graph

the areas are corrected according to the following formula:

$$\text{Corrected area} = \text{measured area} \times \frac{.133}{\text{thickness}}$$

In this particular case the corrected area =

$$9.46 \times \frac{.133}{.178} = 7.07 \text{ sq. in.}$$

The curve was obtained for the first break only. If the curves for the other two breaks had been drawn, they would have varied from the first curve only in length. The average length of the curve is determined by the average tensile strength and the average per cent elongation.

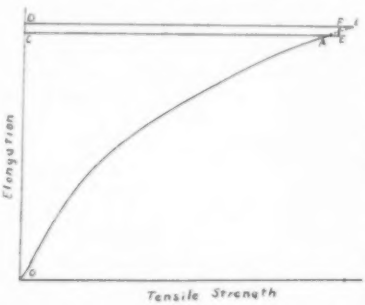


Fig. 3. Correction of Stress-Strain Data

In Fig. 3, the curve as drawn is shown by OA with an extension to B which is the average break. There is a correction area to be added to the area taken from the curve represented by E C D F E.

If we designate the tensile strength and elongation of the first break during which the curve was drawn as T_{1B} and E_{1B} and if we designate the average tensile strength and elongation as $\overline{T_{AB}}$ and E_{AB}, then the area to be added will equal

$$\frac{\left(\frac{T_{AB} + T_{1B}}{2}\right)\left(E_{AB} - E_{1B}\right)}{90000} \text{ square inches.}$$

The correction to be added in this particular case is

$$\frac{\frac{3240 + 3220}{2} \times (610 - 594)}{90000} = 0.57 \text{ sq. in.}$$

The area finally corrected will be 7.07 + 0.57 = 7.64 square inches.

The load at the several elongations can be read directly from the curve. At 300 per cent elongation, the load is 35 pounds; and at 450 per cent elongation 80 pounds. Since the cross-section of the test piece is .178 by .25 square inches, the respective loads in pounds per square inch are 785 and 1,800.

To summarize, the physical properties of this test piece are:

Per cent elongation at break	610
Tensile strength, lbs. per sq. in.—at break	3240
Area in sq. in. under stress-strain curve at break	7.64
Load, lbs. per sq. in.—300 per cent elongation	785
Load, lbs. per sq. in.—450 per cent elongation	1800.

In the case of a few stocks where there has been considerable flow of the stock during molding, the test pieces give different stress-strain curves. It is possible that the average tensile might be higher than for the curve with a lower elongation. In such cases the second correction to the area will be omitted and it would be well to draw the curve for each break.

EMPLOYMENT INCREASE IN NEW YORK STATE

There is another general increase in the number of employes in the manufacturing industries of New York State, according to Henry D. Sayer, Industrial Commissioner, State Department of Labor, the increase for October amounting to about 3 per cent. It is noted that employment rose in the rubber factories of the state, due to gains in the manufacture of rubber coats, rubber shoes and druggists' rubber sundries.

Tariff Bills for 1913 and 1922 Compared

Facts of interest to the tire and rubber industry are revealed in a comparison of the Tariff Act of 1913 and that of 1922. It will be noted in general that the 1922 rates are higher than those for 1913, although in a few examples the case has been reversed.

The list of manufactured goods shows, among its leading items, that in the 1922 tariff bill rubber tires, whether for automobiles, motorcycles, or bicycles, are now 10 per cent ad valorem, whereas they are omitted in the 1913 duties. Belting for machinery, at present 30 per cent ad valorem, now has a rate exactly double that of 1913; card clothing, rubber-faced, has risen from 35 per cent ad valorem to 45 per cent ad valorem; while hard rubber goods are now 35 per cent ad valorem, as compared with the previous rate of 25 per cent ad valorem. Balls, for golf, tennis, etc., are now all 30 per cent ad valorem, while toy balloons are 70 per cent ad valorem. Fountain pens, under the new ruling, are now 40 per cent ad valorem, instead of the previous 25 per cent. Manufactures in which rubber is of chief value, and not specially provided for, previously 10 per cent, are now 25 per cent ad valorem; insulating materials are 30 per cent ad valorem, while scrap rubber, crude india rubber and gutta percha, including jelutong or pontianak, guayule, gutta balata and gutta siak, are admitted free of duty. Tire fabric has the unchanged rating of 25 per cent ad valorem, while waterproof cloth has risen from 25 to 30 per cent ad valorem. Druggists' rubber sundries, with 1913 duty of 15 per cent ad valorem, are omitted from the 1922 tabulations.

The list of chemicals reveals that litharge, formerly 25 per cent ad valorem, is now 2½ cents per pound; lithopone now has a duty of 1¾ cents a pound; while gas black has risen from 15 to 20 per cent ad valorem. Zinc oxide, formerly 10 per cent ad valorem, is now 1¾ cents a pound; thiocarbanilide now has a duty of 55 per cent ad valorem, and hexamethylene tetramine is at present 25 per cent ad valorem. Talc, pulverized, formerly 15 per cent ad valorem, is now 25 per cent ad valorem, while the duty on china clay has risen from $1.25 a ton in 1913 to $2.50 a ton in 1922. Carbon tetrachloride, formerly 1 cent a pound, is now 2½ cents a pound, while aniline oil, with a duty in 1913 of 10 per cent ad valorem, is now 55 per cent ad valorem. Other interesting items will be noted in the lists as given below.

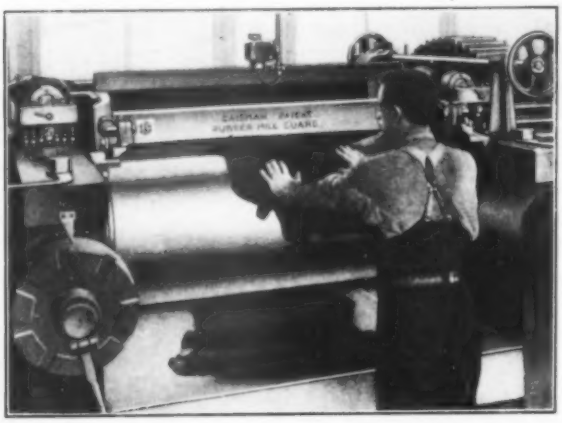
	1913		1922	
Articles	Tariff No.	Duty, per cent ad valorem	Tariff No.	Duty, per cent ad valorem
Asbestos manufactures	367	10 and 20	1,401	30 and 25
Balloons, toy	...	.....	1,414	70
Balls, golf, tennis, etc.	...	.....	1,402	30
Batteries, electric storage	...	.....	320	40
Belting, machinery	262	15	913	30
Card, clothing, rubber faced cloth	124	35	337	45
Chicle, crude and refined	36	15 cents per lb. and 20 cents per lb.	25	10 cents per lb. and 15 cents per lb.
Cloth, waterproof (chief value cotton)	254	25	907	30
Cotton clothing (chief value cotton)	256	30	919	35
Fountain pens	157	25	353	40
Golf balls, see Balls.				
Guayule	...	.....	1,594	Free
Gutta balata and gutta siak	...	.....	1,594	Free
Gutta percha, manufactures of	368	10	1,439	25
Hose, for liquids or gases	...	.....	1,007	17 cents per lb. and 10 per cent ad valorem
India rubber				
Hard	369	25	1,440	35
Manufacture, n. s. p. f.	368	10	1,439	25
Refuse or scrap	513	Free	1,594	Free
Tires, auto, etc.	...	.....	1,439	10
Insulating materials	...	.....	1,439	30
Insulators, molded, india rubber	...	.....	1,439	30
Jelutong or pontianak	...	.....	1,594	Free
Manufactures of				
Cotton or cotton cloth, n. s. p. f.	266	30	921	40
Silk, n. s. p. f.	318	45	1,211	60
Vegetable, fibers, n. s. p. f.	284	35	1,021	40
Pens, fountain	157	25	353	40
Scrap				
Gutta percha	...	.....	1,594	Free
India rubber	513	Free	1,594	Free
Silk				
Braces, cords, garters, suspenders, etc.	319	60	1,207	55
Suspenders, cotton	262	25	913	35
Tire fabric	262	25	905	25
Tires				
Automobile, motor cycle, and bicycle, rubber	...	.....	1,439	10
Toys,				
Balloons	...	.....	1,414	70
India rubber	150	40	....	.....
Woven fabrics,				
Asbestos	367	10 and 20	1,401	30 and 25
Chemicals				
Ammonia				
aldehyde	...	.....	2	30% ad valorem
carbonate	7	$0.0075 per lb.	7	$0.015 per lb.
Aniline oil	23	10% ad valorem	27	55% ad valorem
Antimony				
sulphides	...	.....	8	25% ad valorem $0.01 per lb.
Barium				
carbonate	10	15% ad valorem	12	$0.01 per lb.
sulphate or blanc fixe	...	.....	69	$0.01 per lb.
Benzene	...	.....	1,549	Free
Benzine	561	Free	1,633	Free
Burgundy pitch	437	Free	1,540	Free
Carbon tetrachloride	19	$0.01 per lb.	18	$0.025 per lb.
Chemical wood pulp	649	Free	1,616	Free
China clay or kaolin	76	$1.25 per ton	207	$2.50 per ton
Gas black	53	15% ad valorem	73	20% ad valorem
Hexamethylene, tetramine	...	.....	41	25% ad valorem
Kaolin				
See china clay				
Litharge	56	25% ad valorem	74	$0.025 per lb.
Lithophone	...	.....	79	$0.0175 per lb.
Magnesia				
calcined	42	$0.035 per lb.	50	$0.035 per lb.
carbonate, precipitated	42	$0.015 per lb.	50	$0.015 per lb.
Oil				
aniline, see aniline oil				
benzene, see benzene				
Orange mineral	56	25% ad valorem	74	$0.03 per lb.
Red lead	56	25% ad valorem	74	$0.0275 per lb.
Talc, pulverized	69	15% ad valorem	209	25% ad valorem
Thiocarbanilide	...	.....	27	55% ad valorem
Zinc oxides				
leaded	61	10% ad valorem	79	$0.0175 per lb.

New Machines and Appliances

Effective Rubber Mill Guard

THE mill guard represented in the illustration consists of a light, rigid, aluminum plate placed at an angle to the mill roll, but not impeding the view of the operator. The plate is carried at each side in housings attached to the cap frames of the machine. The space between the edge of the guard and the roll varies from 1⅝ inches up to 2¼ inches, actuated automatically by the batch thickness and assisted by the balance of the guard to accommodate the passage of the material.

While offering absolute protection to the most careless worker, the guard actually increases production very considerably by



Gaisman Mill Guard Automatically Raised by Extra Thick Batch

adding to the confidence of the piece-rate worker. Guards should be fitted to both front and back rolls, entirely eliminating all chance of accident from either side of the mill. With a guard over each roll a hopper is formed to contain compounding ingredients, which relieves the operator from some of the shoveling of compound otherwise necessary.—Francis Shaw & Co., Ltd., Bradford, Manchester, England.

The Palnut Safety Lock Washer

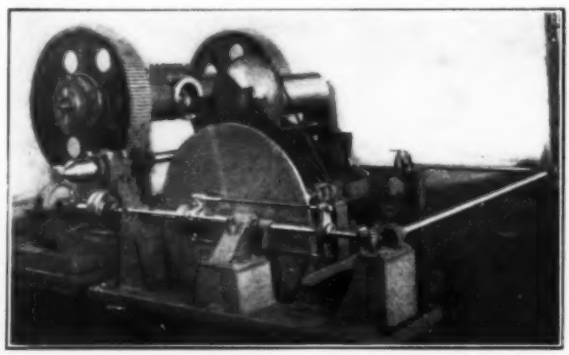
This lock washer embodies a new principle in safety lock washer construction, combining ease, efficiency and economy. The principle of action depends on a coned disk washer that engages a single screw thread. Pressure of the nut upward tends to flatten the washer, bringing the horizontal lines nearer to the nut and making the grip more effective.

The grip upon the bolt embraces almost a complete circle and not at three or four points only. A quarter turn of the washer serves to effectually lock the nut to which it is applied.—The Palnut Corporation, Passaic, New Jersey.

High Speed Double Tuber

The construction of the double tubing machine here shown is such that it allows a speed greater than a single type machine can stand. All guards are removed to show the details of gearing.

The worm operates at 120 revolutions per minute and the drive is direct connected to a 100 h. p. motor which is the same size as used on a 24 by 66-inch high speed calender. The details of the driving mechanism of the stock conveyor are shown in the foreground of the picture. There is a large friction disk for variation



Double Tuber and Conveyor Drive

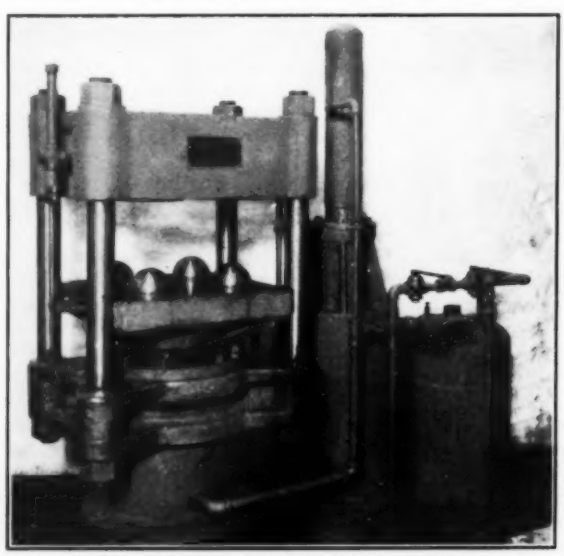
of the speed, conveying power by a chain belt to the driving roll of a belt conveyor not shown.

A double tuber of this sort is designed for forming solid tires and other heavy work.—The Allen Machine Co., Erie, Pennsylvania.

Hydro-Pneumatic Steam Platen Press

An inexpensive installation for producing vulcanized molded rubber goods, and that does away with pump and accumulator, is represented in the illustration.

It is a standard 24 by 24-inch steam platen press operated



Self-Contained Vulcanizing Press

directly from the air line. The ram of the press is actuated by hydro-pneumatic pressure derived from the cylinders shown. The one farthest to the right is the hydro-pneumatic filling tank which is filled with water to approximately three-quarters of its capacity. The remaining space is filled with air at 125 pounds pressure from the air compressor. The filling tank is connected with the press

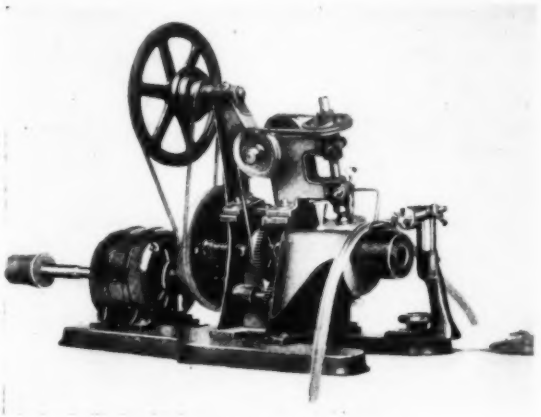
cylinder and the pressure serves to raise the ram, closing the molds. Following this the air pressure is admitted through a secondary air cock into the hydro-pneumatic intensifier cylinder, seen next the press, which in turn raises the pressure in the hydraulic cylinder of the intensifier to 1,500 pounds per square inch and transmits it to the press cylinder thus giving the press full capacity of its power.

The entire equipment is inexpensive and compact requiring but 30 by 80 inches floor space and an overall height of 6½ feet.—Southwark Foundry & Machine Co., Philadelphia, Pennsylvania.

Rubber Strip Trimmer

The illustration shows one of a group of electrically driven, light bench machines designed to trim molded rubber goods of many sorts.

The one pictured is adapted for trimming goods made in strip form as tire beads, windshield rubbers, etc., and is shown trimming glass channel rubber. A wood roll is attached to the lower cutter, which supports the strip. The pressure applied on the spring roller holds and draws the strip over the roll and removes the overflow. The strip can be removed or started in at any time without stopping the machine.



Trimmer for Molded Goods

On the motor end of the machine is a holder for buffing spindles which is very convenient for trimming or buffing the inside of rubbers.—T. W. Morris, 3304 Warren avenue, Chicago, Illinois.

Automatic Electric Repair Vulcanizer

Steam vulcanizers operated by electric current are not common as yet, and, so far, are met with for minor installations only.

The pictures here shown represent an automatic electric steam vulcanizer in which an automatic cutout maintains steam pressure within approximately one pound of where it is set. These vulcanizers have been designed for portability, with correct shape and a strong clamping system. They are insulated to reduce current consumption, and operated by current from an ordinary light socket.

Tire and Tube Vulcanizers

When the desired amount of steam is generated the steam pressure turns the current off and then on again when the pressure drops about one pound. Provision is thus secured against overcuring the repair, and economy and safety of operation are assured.—The Cross Vulcanizer Co., Denver, Colorado.

Tire Rimming Press

A very effective and simplified rimming press of new design is here pictured. The operation of the jaws is accomplished by the movement of the ram by hydraulic pressure without the need of hand-operated movements of any sort.

Automatic Rimming Press

These presses are built in either three or four-arm construction as desired and for any pressure up to 500 pounds. Application has been made for a patent by the builders.—The Adamson Machine Co., Akron, Ohio.

Tire Patch Trimmer

A tire patch trimmer with which one can cut an old casing into patches of any size after removal of the bead, is represented in the illustration.

The throat of the machine is 13 inches long and has a gage that can be set at any distance for cutting patches the same length. The machine is geared three to one to afford ease of operation by hand. The two self-feeding knives are of hardened steel. The machine cuts clean square patches and will handle any fabric however tough.—The P. S. M. Co., Minneapolis, Minnesota.

Progressive Trimmer

Grease Gun Lubricator

An effective grease gun perfected for automobile lubrication is now being introduced for lubrication in the industrial field. The illustration shows the device and its several auxiliary parts, including filler, wrench, nipples and fittings. This tool affords

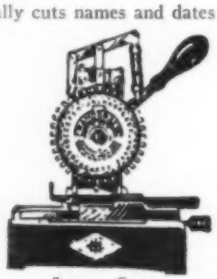
a very safe and effective means for placing grease in locations difficult or dangerous of access and has found favor in leading

High Pressure Lubricator and Parts

rubber manufacturing plants.—Carr Fastener Co., Boston, Massachusetts.

Namograph Lettering Machine

The machine here illustrated automatically cuts names and dates in gold on fountain pens, hard rubber pencils, cigar holders, pipe stems, toothbrush handles, thermometer cases and all other small cylindrical articles of celluloid, hard rubber, bakelite and similar hard plastic molded compositions.



Letter Cutter

The machine works from any lamp socket, is durably built, and occupies a space of only seven by four inches.—Modern Inventions Corporation, 1123 Broadway, New York, N. Y.

Removable Head Steel Barrels

Shipment of latex from the Far East will doubtless gain rapidly in volume with the development of its industrial use. A gallon of latex weighs essentially the same as a gallon of water; therefore, the reported United States importation of 400,000 pounds of latex the past summer would require 9,400 barrels of 50 gallons capacity each. Steel drums and metal bilge steel barrels, especially the latter, with full removable head, should come largely into use for latex shipments.

"Perfect" Metal Bilge Barrel

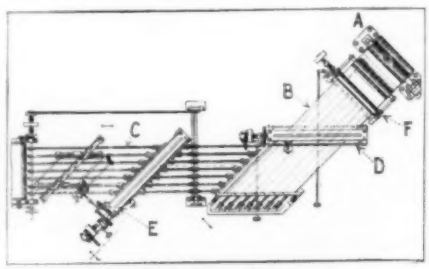
The illustration represents a metal bilge barrel of this type made in 30 or 55 gallon sizes. The head is removable in one piece. The closing device is simple, yet effective. A half turn of the lugs closes or opens the package. Eight turns of a wrench and the cover is positively locked in place, the closure being air-tight. Having no loose parts to become lost, the barrel is always ready for the next trip.—Detroit Range Boiler and Steel Barrel Co., Detroit, Michigan.

Machinery Patents

Bias Cutting and Splicing Machine

A combination machine for cutting, splicing and feeding rubber coated fabric for tire making is here shown in plan.

In its passage through the machine the coated strip of textile material is cut on the bias into short sections, and united to form strips of desired length which are advanced through the machine, and delivered to a conveyor mechanism ready for use in tire building.



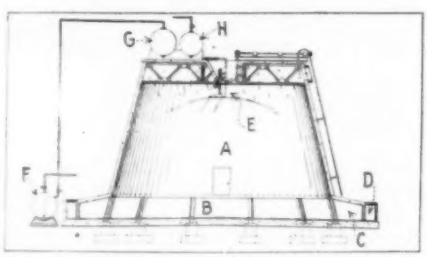
De Mattia Bias Cutter

The arrangement includes a support A for the coated fabric and liner, feed rollers F, primary and secondary strip-advancing mechanism B and C arranged at an angle with each other, with suitable stops or gages for determining the advance of the fabric, together with cooperating cutters D and E to sever the fabric into bias strips. The secondary mechanism C and cutter E control progressively the length of strip cut from the bias strip as the diameter of the built up tire blank increases.—Barthold De Mattia, Clifton, New Jersey. United States patent No. 1,428,420.

Apparatus for Spraying Rubber Latex

An apparatus for treating and drying latex in the form of comminuted particles which, by subsequent treatment may be united to form crude rubber or rubber compounds is here illustrated.

It comprises a chamber A in form of a truncated cone encased in heat insulated covering. The bottom of the chamber B is spaced from the sidewall and the sidewall extension to form with the latter an outlet passage C surrounded with a duct D provided with one or more removable gates. The roof of chamber A contains a series of removable perforated plates held in a framework. A furnace, not shown in the figure, provides heat to the drying medium.



Latex Spraying Machine

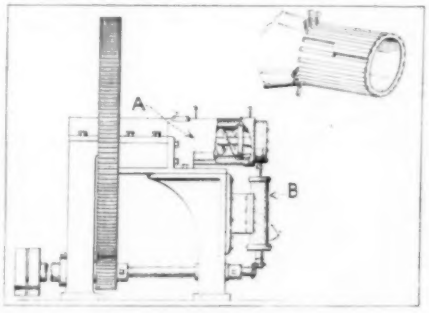
The spraying mechanism E is located centrally in the top of the chamber; E and G are the main and auxiliary latex tanks; H is a water supply tank for regulating the temperature of the disk sprayer. By suitable arrangement a supply of mixed combustion products and air is derived from the furnace and admitted to the spraying chamber for drying purposes.

In operation, latex from tank H is sprayed into the chamber containing warm, non-oxidizing combustion gases, which also contribute some coagulating effect, producing an unoxidized dry rubber.

The particles obtained by this method show under the microscope as transparent spheres. The material collected at the bottom of the chamber is extremely porous and for this reason when it contains moisture may be readily dried.—Charles E. Bradley, Montclair, New Jersey, and Joseph G. Coffin, Hempstead, New York, assignors to General Rubber Co., a New Jersey corporation. United States patent No. 1,428,526.

Machine for Striped Tubing

A tubing machine for forming rubber tubing with surface stripes of different colored rubber is pictured in the accompanying illustration. The insert shows the stripe insertions.



Tuber for Striped Goods

The striped effect is obtained by use of a supplementary tuber B which supplies the stripe stock to the surface of the tube formed by the tuber A, through a special form of die regulating the width and spacing of the stripes.—Melvin S. Lower, assignor to The Faultless Rubber Co., both of Ashland, Ohio. United States patent No. 1,428,381.

Other Machinery Patents

The United States

1,430,699 Apparatus and method for making hollow rubber articles. H. R. Stratford, Cleveland, O., assignor by mesne assignments to Paramount Rubber Consolidated, Inc., Philadelphia, Pa.
1,431,118 Mandrel. R. E. Jenkinson, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.
1,431,366 Machine for mounting tires on sealing rings. R. Brushwiler and A. Otto, assignors to Morgan & Wright—all of Detroit, Mich.
1,431,403 Apparatus for refinishing blemished tires. W. Kearns and H. P. Connelly, assignors to Morgan & Wright—all of Detroit, Mich.
1,431,541 Machine for cutting disks from sheet material. C. J. Randall, Naugatuck, Conn., assignor to The Goodyear's Metallic Rubber Shoe Co., a Connecticut corporation.
1,432,004 Apparatus and method for making resilient tires. G. H. Wheatley, Chicago, Ill.
1,432,262 Machine for removing cores from molds. H. Schelhammer, Whitestone Landing, assignor to American Hard Rubber Co., New York—both in New York.
1,432,469 Press and process for vulcanizing rubber shoes. P. J. Klein and E. Kenny, Naugatuck, Conn.
1,432,531 Tube-wrapping lathe. A. L. Chandler, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,432,901 Tire mold. H. Raflovich, Buffalo, N. Y.
1,432,967 Tire-changing machine. J. V. Clark, Steubenville, O.
1,433,320 Wire-stripping machine. C. J. Wersel, Norwood, O., assignor to Allis-Chalmers Manufacturing Co., Milwaukee, Wis.
1,433,561 Apparatus for lubricating inner tubes. D. C. McRoberts, Indianapolis, Ind., assignor to G & J Tire Co., an Indiana corporation. Original application divided.
1,433,683 Apparatus and method for vulcanizing tires. W. C. Geer, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,433,971 Apparatus and method for preventing air bubbles in laminated rubber articles. F. T. Roberts, Cleveland, O.
1,434,320 Elastic braiding machine attachment. G. E. Swan, Providence, R. I.

The Dominion of Canada

224,196 Sectional tire core. F. Smith and T. H. Brittain, coinventors—both of Akron, Ohio. U. S. A.
224,245 Rubber boot and shoe repairer. E. C. Julian, Elwood, Ind., U. S. A.
224,300 Steam platen for presses. The E. W. Bliss Co., New York, N. Y., assignee of A. C. V. Malm, Lansdowne, Pa.—both in U. S. A.
224,301 Apparatus for making tire flaps. The Canadian Consolidated Rubber Co., Ltd., Montreal, Que., assignee of A. O. Abbott, Jr., Detroit, Mich., U. S. A.
224,312 Apparatus for molding tire casings. The B. F. Goodrich Co., New York, N. Y., assignee of J. R. Gammeter, Akron, Ohio—both in U. S. A.
224,313 Heel mold washering device. The B. F. Goodrich Co., New York, N. Y., assignee of W. D. Kmentt, Akron, O.—both in U. S. A.
224,636 Puncture repair device for tires. R. Staffiej, Detroit, Mich., U. S. A.
224,685 Steam vulcanizer. G. W. Harward, assignee of F. P. Anderson—both of Flint, Mich., U. S. A.
224,777 Tire mold. M. Greenspan, Chicago, Ill., U. S. A.
224,909 Tire inflation testing appliance. The Weaver Manufacturing Co., assignee of I. A. Weaver—both of Springfield, Ill., U. S. A.

The United Kingdom

184,265 Repair vulcanizer. W. Frost, 150 Great Portland street, London. (Reference is made to Specifications Nos. 183,590 and 7477/94.)

Germany

Patents Issued, with Dates of Issue

363,034 (August 24, 1921) Vulcanizing apparatus. Herbert K. Wheelock, Evanston, Illinois, United States; represented by A. Trautmann and H. Kleinschmidt, Berlin S. W. 11.

Process Patents

Latex Rubberized Fabrics

Another use of latex appears in a recent invention for coating materials, where latex can be substituted for rubber solution. First applied to a backing, the resulting film is then transferred to the material to be coated. The film of rubber forms as the latex dries or is deposited therefrom; it may be washed and finally vulcanized. Several sheets of coated fabric may be joined in order to form compound fabrics.—P. Britton and Griffiths Bros. & Co. (London), Limited, 29 Mack's Road, Bermondsey, London. British patent, No. 184,578.

Other Process Patents

The United States

1,430,677 Manufacturing rubber shoes. Yosaku Ose, Tokio, Japan.
1,431,471 Making acidproof rubber containers. J. Lehr, assignor to The Miller Rubber Co.—both of Akron, O.
1,432,311 Assembling pneumatic tire in relation to a rim. H. W. van Meeteren, assignor of 1/3 each to A. Edwards and H. Headley—all of Birmingham, Eng.
1,432,895 Reclaiming rubber by mechanical disintegration in non-solvent dispersion medium. H. Plauson, Hamburg, Germany.
1,432,973 Making belts. H. W. Delzell, Akron, O., assignor to The B. F. Goodrich Co., New York, N. Y.
1,433,291 Making rubber tires. J. G. Moomy, assignor to Mary H. Moomy—both of Erie, Pa.

The Dominion of Canada

224,401 Molding pneumatic tires. S. J. Glenn and S. H. Moore, coinventors—both of Brampton, Ont.

The United Kingdom

184,221 Manufacture of trunks of molded leather and rubber, vulcanized without heat, etc. A. V. Watts, 87 George street, Bedford.
184,305 Retreading tires. A. W. Thomson, Chichester House, Double street, Spalding, Lincolnshire.
184,468 Producing spongy rubber. F. Pfleumer, 48 Marienstrasse, Dresden, Germany. Not yet accepted.
185,088 Covering tennis balls while inflated. Revere Rubber Co., 59 Reade street, assignee of W. A. Gibbons, 561 West 58th street—both in New York City, U. S. A.

Germany

Patents Issued, with Dates of Issue

363,154 (January 26, 1917) Making pneumatic tires. The Miller Rubber Co., Akron, Ohio, U. S. A.; represented by E. Peitz, Berlin S. W. 68.
364,005 (March 17, 1922) Shaping solid tires. Max Müller, Maschinen- und Formenfabrik, Hannover-Hainholz.

TUBING IN "TALKING MOVIES"

Rubber tubing is an important adjunct of a device by Russell Hart, of Alhambra, California, for projecting the voices of actors to a theater audience while the scenes in which they speak are being shown by a motion picture camera. In a recent demonstration, the inventor talked into a length of rubber tubing attached to an acetylene burner of original design, and the voice vibrations carried into the flame were photographed on the margin of a film passing through a cinema camera. The film with the sound record was then rerun through an attachment on the camera so as to vary the rays from a 32-candle spotlight playing through a ¼-inch aperture upon a selenium electric cell peculiarly sensitive to light. The feeble current from the cell was then "stepped up" in radio telephone fashion with an audion detector, amplifier, and loud speaker and the voice sounds perfectly synchronized with the movements of the film folks.

Treated Liners for Tacky Stocks

Difficulties in Common Practice—High Cost of Sticking Liners—Repair Stocks—Chemitex Treatment —Economy of Treated Liners

By C. O. North[1]

EVERY compounder recognizes the great importance of having stocks sufficiently tacky to make good unions. There is scarcely a building operation in the rubber industry where sufficient tack is not a prime essential. In many cases of ply separation, lack of tack is the principal cause. This is particularly true in cases of tread separation which can usually be attributed to dry stocks. In general it may be stated that compounds should be as tacky as possible without injuring the rubber.

Difficulties in Common Practice

Hitherto the common practice has been to roll up stocks in cloth liners. In order that compounds may readily come out of these liners it is necessary that they be somewhat dry or covered with a slight bloom.

In order to obtain just the right degree of tack which will build reasonably well and still come out of the liner, requires a close control which is difficult to maintain. The result is many stocks are run entirely too dry. In plants where this is a general rule, separation of all kinds is usually rather prevalent. On the other hand, where the plant management desires to run with a maximum of tack and chooses to err on the other side, there is always more or less trouble about cleaning the liners and always considerable waste. Such companies seldom hear of separation and take their losses in stock and liners sticking together.

The High Cost of Sticking Liners

The illustration shows an accumulation of scrap made in less than six months' operation due to "sticking to liner." It was found in the yard of a small plant making about 300 tires per day. The scrap shown does not represent the entire amount of fabric lost because a considerable portion had been previously used in preparing fiber stocks. Of the ten rolls shown, nine are ends of rolls which stuck so badly that they would not yield to solvents or manpower. The large roll absolutely could not be opened.

These ten rolls contain 1,900 linear yards of tire fabric, and sufficient ply stock for the manufacture of 500 tires. The direct losses sustained may be summarized as follows:

DIRECT LOSSES

2,000 yards of liner E duck @ $0.38	$760.00
1,900 yards 17¼ ounces tire duck @ $0.70	1,330.00
2,500 pounds friction and coat stock @ $0.21	525.00
Calendering expense, trucking and rerolling	38.00
Labor salvaging parts of nine rolls, 144 hours @ $0.50	72.00
Solvent—tetrachloride, 45 gallons @ $1.30	58.50
	$2,783.50
Salvage value of 6,700 pounds scrap @ $0.02	134.00
Net loss	$2,649.50

The net figure is not the complete loss by far. Indirect losses due to slowing up of all operations in the factory and deformation of the cord fabric in building increase the total to at least $3,500. The slowing of operations is because stocks come out of the liner with difficulty and more men are required to get the daily tire output from the plant. Loss also enters into the building operations where it is practically impossible to secure uniform tension on a tire building machine when the stocks stick to the liner. It is a well recognized and important feature in tire construction to place each ply with properly modulated tension or, as some designers claim, to place each ply with exactly the same tension. Obviously gradation in tension or maintaining equal tensions is much more difficult when a variable factor like "sticking to the liner" is introduced. Moreover when tire builders have trouble handling the ply stock, particularly in cord fabric, there is a great tendency for them to spread the cords and therefore weaken the fabric.

Six Months' Accumulation of Scrap Due to Sticking Liners

It may be mentioned that the cost of cleaning liners in regular production in the above plant has averaged $249.50 per month for the last six months.

Repair Stocks

In the preparation of repair or so-called shipping stocks, the importance of tack is not only well recognized but is so great that every company manufacturing such stocks uses either holland or a heavy grade of paper. The use of holland or starched muslin is of course out of the question in regular factory practice where so many liners are in use and rough handling is the rule. Paper is also barred because of the ease with which it tears.

Many investigators have given their time to the search for some cheap, simple treatment applicable to an ordinary liner which would thoroughly prevent sticking. We have had many examples of treatments with pyroxolin softened with castor oil which gave fairly good service for a time. Unfortunately pyroxolin treatment is expensive and the castor oil has a tendency to bloom out, defeating the object. Stock comes out of such a liner with less than its original tack.

Glue, glycerine soap preparations have also been tried. Some of these seemed quite promising but were too stiff and consequently the liner had a great tendency to crack and would not handle well in the calender room. Moreover the glue coating has a tendency to come off the liner and stick to the rubber.

Chemitex Treatment

The problem of a non-stickable liner is of interest to the whole trade. It has been studied for several years by a leading rubber

[1] The Rubber Service Laboratories Co., and the Chemitex Co., Akron, Ohio.

chemist[2]. He has developed the Chemitex treatment, which is so satisfactory that the first cost is negligible. It consists essentially in applying a suitable emulsion to the liner and giving it a heat treatment. The coating so secured cannot be removed by any means. It is absolutely untouched by all solvents and will stand any amount of rubbing or chafing. Moreover it has the effect of strengthening the fabric to the extent that it is not necessary to use as heavy a liner as E duck. It is perfectly satisfactory to coat a 6-ounce sheeting on both sides with the Chemitex compound, thus securing a liner to which no stock, no matter how tacky, will stick.

At one plant this liner was given a severe test with very soft friction stock run to about the consistency of putty. The fabric was coated and run into the Chemitex liner. The roll, containing about 500 yards, was laid down on the floor in a warm room, where it was allowed to remain several days. At the end of that time it was taken up and the stock came out of the roll in a perfectly satisfactory manner.

Economy of Treated Liners

Assuming that a liner is turned over once in three days, 6,500 yards are necessary in a plant producing 500 tires per day. The use of 6-ounce liner instead of the usual 10-ounce E duck effects a saving of about 10 cents per yard or $650 on 6,500 yards.

In the case cited above this means the possible saving of about $3,300 in direct loss for six months. The cost of 6,500 yards of 61-inch treated liner coated both sides, figures $2,925. Thus the cost of treated liner figured on maximum widths against losses figured with extreme conservatism is repaid in savings within six months and shows a profit of $500.

In addition the indirect gains of improved unions, increased speed of operation and increased quality of product are so important that the cost of liner treatment becomes by comparison a negligible quantity.

Treated liners for ply stock represent but an instance of its use in a tire factory. Trouble from tackiness or its lack is often experienced with tube stock, breakers, cushions, covers, gum strips, and in fact, with every stock that must be wrapped up in cloth for handling in rubber manufacturing processes.

[2] R. C. Hartong, The Rubber Service Laboratories, and The Chemitex Co., Akron, Ohio.

TREAD, BREAKER, CUSHION IN ONE

A saving of from 150 to 200 per cent in time for repair men is claimed for the "Warco," a new partially-cured built-up tread made in camelback form with breaker and cushion attached. While being made the tread stock is in contact with a steam-heated platen and is slightly cured, the breaker strip somewhat less so, and the cushion is just touched by the cure on its lower surface, the upper side being left cold and tacky, having been in contact with a platen cooled with running water. The claim is also made that the partial cure sets the stock to a degree and prevents it flowing too freely at the ends of the retread molds. After a carcass is cleaned and cemented a strip of the new material is applied and given the usual cure, two operations being dispensed with, namely, separate applications of cushion and breaker. The "Warco" is made in 3¼, 4¼, 4¾, and 6¼-inch widths.—West American Rubber Co., 400 North Avenue 19, Los Angeles, California.

PERDRIAU RUBBER COMPANY PROSPERS

A most encouraging report has been lately rendered by the Perdriau Rubber Co., Limited, Sydney, Australia, disclosing a net profit of £58,612 for the year ended June 30, compared with a loss of £924 for the preceding year. A 7 per cent dividend on preference shares was declared, and another of 10 per cent (including interim) on ordinary shares.

Quarterly Review of Rubber Exports[1]

For the fourth consecutive month the total value of exports of rubber manufactures from the United States has registered a decline, the September total of $2,659,308 being nearly $130,000 less than for August. This is chiefly because of the seasonal decline in exports of automobile casings, solid tires, and rubber-soled canvas shoes to countries in the Northern Hemisphere.

The industrial rubber goods trade is improving generally, and the exports of rubber boots and rubbers also reflect increased activity in these territories. The large reductions of tire prices have been instrumental in lowering the value of exports. While the tire and rubber-soled canvas footwear trade is decreasing in the Northern Hemisphere, such markets as Argentina, Uruguay, Australia, New Zealand, and British South Africa are entering their most active season.

Largest Trade During Second Quarter

Taking exports as a whole for the first three-quarters of 1922, the second quarter was the period of greatest activity, the exports of pneumatic casings reaching 355,988, as compared with 304,844 in the first quarter and 333,610 in the third quarter. Solid tires also reached their largest total in the second quarter—13,954, as compared with 12,512 during the third quarter. The trade in canvas rubber-soled shoes decreased from 979,211 pairs in the second quarter to 747,996 pairs in the third; druggists' rubber sundries from 209,031 pounds to 161,092 pounds; and rubber hose from 922,716 pounds to 853,043 pounds. The average value per pneumatic casing exported during the second quarter was $13.99 and in the third quarter $11.84, which accentuates the recent decline in total value of exports, although the average value per pair of rubber-soled canvas shoes, which increased from 77 cents to 81 cents, and the average value per pound of rubber hose, which increased from 35 cents to 38 cents, have offset this tendency in some measure.

Increased Exports of Rubber Footwear and Mechanical Goods

Just as the second quarter showed the greatest seasonal activity in the trade in tires and rubber-soled canvas shoes, similarly the exports of rubber boots and shoes increased during the third quarter. In July, August, and September, 77,672 pairs of rubber boots, valued at $196,044, were exported as compared with 62,780 pairs, valued at $177,083, during the preceding quarter, while the exports of rubber shoes in the third quarter—333,145 pairs valued at $227,576—are over twice those for the second quarter—143,683 pairs valued at $122,147. This increase in exports of rubber shoes is due to the shipment of 196,232 pairs during September—the chief markets showing increased trade being Esthonia, 75,000 pairs; Turkey in Europe, 25,700; Switzerland, 16,449; Norway, 15,691; Spain, 6,717; Scotland, 6,677; Palestine and Syria, 4,433; and Belgium, 2,556 pairs.

Other commodities showing consistent increases during the third quarter of the year are shown in the following table:

EXPORTS OF RUBBER PRODUCTS, JANUARY-SEPTEMBER, 1922

Articles	First Quarter Pounds	Second Quarter Pounds	Third Quarter Pounds
Rubber belting	461,545	488,106	691,915
Rubber packing	227,161	261,170	317,373
Rubber soles and heels	236,935	319,033	480,467
Inner tubes, *number*	190,206	239,563	274,099

[1] By E. T. Holt, Acting Chief, Rubber Division, Department of Commerce, Washington, D. C.

A DEVICE FOR RECHARGING RADIO BATTERIES OVER NIGHT BY attaching to any lamp socket is called the Radio Homcharger de Luxe and has the base of molded bakelite. It is fitted with rubber feet to prevent marring polished surfaces.—The Automatic Electrical Devices Co., 131 West Third street, Cincinnati, Ohio.

Activities of The Rubber Association of America

Monthly Meetings

THE board of directors met at the Lotos Club, New York, N. Y., Thursday, November 23, for its regular monthly meeting, and questions of a routine nature were considered.

The Executive Committee of the Tire Manufacturers' Division held its November regular meeting on Wednesday, November 15. The session was given over almost entirely to the consideration of standards and to the discussion of the proposed employment of the Harvard School of Business Research, to study conditions in the retail tire dealing trade and submit recommendations as to desirable accounting and merchandising methods for retail tire dealers.

The Specification Committee of the Mechanical Rubber Goods Manufacturers' Division met in Washington on November 15, with the Packing Committee and the Rubber Goods Committee of the Federal Specifications Board, which has as its purpose the simplification and coordination of governmental specifications for all goods purchased by the Government. A number of detail changes in the proposed specifications for packing and several classes of rubber hose were recommended by the Specification Committee and accepted by the Federal Specifications Board representatives.

The Executive Committee of the Rubber Sundries Manufacturers' Division met at the Union League Club, New York, N. Y., on the evening of November 14, and a very interesting meeting, from the standpoint of the number of subjects considered and their importance, was held, which points to a very active year for that group in 1923.

The Hard Rubber Division met at the Yale Club, New York, N. Y., November 8, and questions of importance to that group of the industry were discussed.

The Service Managers' Committee of the Tire Manufacturers' Division met in the Tire and Rim Association office at Cleveland, Ohio, on November 2 and 3.

The Traffic Committee met at the New York Athletic Club, New York, N. Y., on Tuesday, November 14.

The Original Equipment Committee, which is composed of the executives of the tire manufacturers furnishing tires as original equipment to car manufacturers, met at the Lotus Club, New York, N. Y., on November 14.

A sub-committee of the Executive Specification Committee on Tires met in the association office on November 21.

Negotiations with Rubber Growers on Restriction

The board of directors and a special committee of this Association has opened negotiations with the Rubber Growers' Association of London, concerning the restriction of crude rubber production by imposing a graduated tax on exports.

The following response was received November 8 to the committee's cable expressing the deep interest of our manufacturers in the restriction plan and inviting a committee from the Rubber Growers' Association to visit the United States to discuss the mutual interest in the restriction plan:

> "Council of Association thank you for friendly message and cordial invitation to New York but consider that as the scheme has only just been started it will be best to wait and see what effect it has on all branches of the rubber industry. Meantime we shall welcome your association's considered advices in regard to U. S. A. needs of crude rubber during 1923 as we are all opposed to any idea of creating actual shortage of supplies. We therefore feel that American manufacturers need have no fear that the scheme will work adversely to their interests."

The Special Committee of this Association met November 10 and in reply sent the following cable to the Rubber Growers' Association:

"The invitation extended to the Rubber Growers' Association to send a committee to the United States is prompted by a sincere desire for a better, broader and more sympathetic understanding between growers and manufacturers. We regret that our invitation is not accepted now, as we feel that the good of the industry requires a closer contact and we believe that if your members have the opportunity of meeting our manufacturers here we would both secure a broader vision than would be possible should we send a committee to London. In reply to your inquiry as to the probable American consumption in nineteen twenty-three, we could, upon receipt of advices from you as to the probable range of prices under the Restriction Act, arrive at a closer estimate of the probable consumption."

In reply to the above the following cable was received from the Chairman of the Rubber Growers' Association of London on November 14:

"Your cable of tenth. Full reply mailed today. If, after reading, you think immediate meeting advisable will send representatives. As to second inquiry, assume average price nineteen twenty-three, one shilling, three pence per pound."

The Abuse of Tires

The work of establishing and applying the standard tire warranty is effectively supplemented by the text and illustrations of a poster on the abuse of tires recently sent to 125,000 tire dealers by the Tire Manufacturers' Division of The Rubber Association of America.

The poster will have the effect of causing some car owners to care better for their tires and will serve to emphasize to the careless user the announcement in the standard warranty that no

Report of Inventory—Production—Domestic Shipments of Pneumatic Casings—Inner Tubes—Solid Tires, Etc.

	Pneumatic Casings				Inner Tubes				Solid Tires			
Month	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments	No. Mfrs. Reporting	Inventory	Production	Shipments
October, 1921	64	3,545,030	1,928,271	1,675,169	64	4,732,016	2,843,918	2,016,371	10	163,299	46,274	45,911
November, 1921	64	3,908,342	1,756,555	1,342,519	63	5,203,568	2,126,211	1,540,299	10	173,451	43,537	34,556
December, 1921	64	3,696,519	1,839,738	1,980,264	64	4,731,021	2,070,098	2,522,710	10	168,515	40,478	39,520
January, 1922	66	4,174,216	2,055,134	1,596,806	66	5,246,647	2,343,393	1,889,724	11	181,769	40,224	33,294
February, 1922	66	4,691,329	2,084,308	1,562,365	65	6,141,956	2,596,774	1,702,583	11	183,448	39,492	36,805
March, 1922	63	5,183,286	2,645,790	2,073,963	63	6,991,118	3,017,511	2,090,737	11	182,197	49,433	48,350
April, 1922	65	5,464,336	2,401,187	2,086,651	65	7,230,096	2,650,573	2,329,343	11	173,748	46,664	52,309
May, 1922	65	5,523,095	2,721,503	2,639,273	65	7,189,552	2,970,696	2,938,947	11	170,904	57,640	60,711
June, 1922	64	5,042,147	2,838,890	3,113,260	64	6,186,534	3,130,629	3,973,679	11	169,808	66,089	63,408
July, 1922	63	4,834,106	2,476,636	2,695,095	63	5,675,839	3,068,199	3,630,744	11	176,375	71,505	60,425
August, 1922	63	4,629,392	2,905,209	3,029,823	63	5,207,228	3,808,224	4,220,055	11	189,698	84,313	69,435
September, 1922	64	4,612,037	2,504,744	2,502,106	64	5,164,757	3,501,442	3,558,971	11	200,016	82,767	66,797

"Production" and "Shipment" figures cover the entire month for which each report is made. "Inventory" is reported as of the last day of each month.

"Inventory" includes tires and tubes constituting domestic stock in factory and in transit to, or at, warehouses, branches (if any), or in possession of dealers on consignment basis, and as a total represents all tires and tubes still owned by manufacturers as a domestic stock.

"Shipments" includes only stock forwarded to a *purchaser* and does not include stock forwarded to a warehouse branch, or on a consignment basis, or abroad.

Compiled by The Rubber Association of America, Inc.

made of rubberized inflatable portions connected by elastic straps over the shoulders and to the waist belt by loops of rubber.

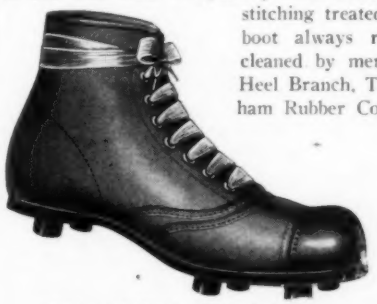
Blankenhagen Safety Swimming Device

The inventor has recently been granted a patent on this safety swimmer.—Albert Blankenhagen, 446 Lamparter street, Akron, Ohio.

British Sports Shoes

The "Joy Shoe" has extra strong unbleached gray or brown duck uppers and sole of pure plantation rubber similar in design to the American "honeycomb" pattern. The "Palatine" football boot features: strong cotton duck uppers thickly waterproofed with rubber; studs molded in one with soles of specially hardened rubber; leather toe-cap; stitching treated against rotting. This boot always remains pliable and is cleaned by merely sponging.—Palatine Heel Branch, The Leyland & Birmingham Rubber Co., Preston, England.

"Joy Shoe"



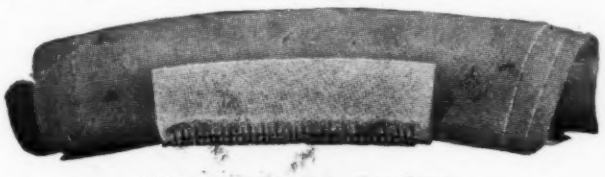
"Palatine" Rubber Football Boot

"Eureka Rubber Preserver"

An indestructible vegetable compound in liquid form is injected into inner tubes through the valve, where it generates a gas of from 10 to 15 pounds pressure, which permeates every part of both tube and casing, keeping the rubber soft and pliable and preventing cracks and checks. "Eureka Rubber Preserver" is put up in dry form with directions for mixing.—Eureka Rubber Preserving Co., Huntington, West Virginia.

Repair Boot for Blowouts and Rim Cuts

The "Keck Safety Boot," shown with the blowout patch in place, may also be used for repairing rim cuts. The danger of making the casing bulge is minimized because no flaps extend over the rim.—The Medina Rubber Co., Medina, Ohio.



"Kick Safety Boot" for Tire Repair

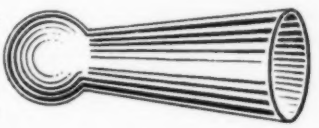
Moccasin Hiking Shoe

The soft leather shoe of the moccasin type equipped with fiber rubber sole is one of the newer developments in the line of sport footwear. It is said to be ideal for the hiker and camper. The illustration shows the Rangeley moccasin for women, to be had in either smoked or chocolate elk, in different heights. —G. H. Bass & Co., Wilton, Maine.

"Rangeley" Moccasin

All Rubber Ear Drum

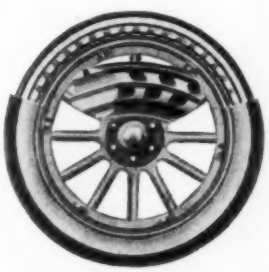
An invisible antiseptic ear drum, of rounded shape, made entirely of soft, pliable rubber, is said to be comfortable to wear and to improve the hearing of deaf people. The device is patented and, while being worn, protects the ears from the cold and maintains an even temperature within them.—A. O. Leonard, Inc., Suite 933, 70 Fifth avenue, New York, N. Y.



Leonard Ear Drum

Cellular Inner Tire Replaces Tube

The Taylor inner tire is constructed of alternate layers of cushion gum, semi-hard rubber, fabric, and cords. Air cells through the cushion gum layers give flexibility and shock absorption. This inner tire takes the place of a tube and protects the tire casing from internal strain.—The Taylor Rubber Co., 828 Penobscot Building, Detroit, Michigan.



Taylor Inner Tire

Rubber Cushioned Disk Wheel

A new development in disk automobile wheels is indicated in the illustration by the circle seen between the rows of rivets next the rim. The circle is the exposed part of a flat ring built up of plies of rubber and fabric molded and cured endless. A series of holes is punched around its inner and outer circumferences to permit it to be riveted between the disks of the wheel where it serves as a cushion, absorbing vibrations and shocks, reducing noise, and extending the life of the machine.—Hall Wheel Corporation, Philadelphia, Pennsylvania.

Hall Cushioned Disk Wheel

Stamp Entirely of Rubber

The all-rubber stamp is not new but this development of it is comparatively so. It has a square base instead of the more usual round one and is molded entirely of soft rubber.

The impression part is so arranged that straight-line dates may be inserted as desired.—Hay Rubber Stamp Co., 826 Thirteenth street, N. W., Washington, D. C.

"All-Rubber" Stamp

"Dayntee Maid" Garter

The "Dayntee Maid" garter is said to be the only silk garter made with elastic woven in the ribbon shirred ready for use. It comes in nineteen hosiery color combinations, boxed in ten-yard pieces.—S. L. Migel & Co., 260 Fourth avenue, New York, N. Y.

Boys' Striking Bag on Folding Platform

Sports goods shops can now better attract boy patrons. The popular striking bag has been combined in an athletic set for boys, with a platform which fastens to the wall by four folding brackets so that the set may be put away in little space when not wanted.—The McDonald-Wilker Co., 319 Main street, Woburn, Massachusetts.

Boys' Athletic Set

"Tirex" and "Fibrex"

"Tirex" mining machine cable is heavily insulated with rubber armor and is portable, yet has the wearing qualities of a cord tire. "Tirex" lamp cord for drop lights or table lamps is rubber armored and made in popular colors. "Fibrex" tree cable permits installation among thick foliage with the minimum amount of tree trimming, yet allows uniform line voltage while it eliminates grounds. It is protected by non-metallic fiber armor, wears very satisfactorily, but is still comparatively inexpensive. — Simplex Wire & Cable Co., 201 Devonshire street, Boston 9, Massachusetts.

"Checker" Bouncing Ball

Molded Play Ball

One development of the hollow rubber play ball is the type having its decoration molded in. The "Checker" bouncing ball is ornamented with an all-over design of checkers. It comes in 5 sizes from 2 to 4 inches in diameter, in three colors—white, black, and maroon.—The Eagle Rubber Co., Ashland, Ohio.

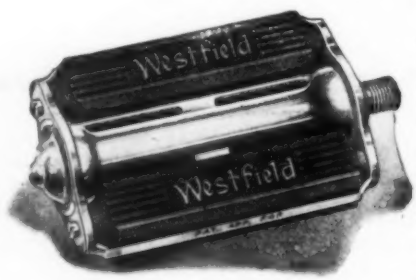
Rubber Stamps Facilitate Record Keeping

Dating attachments for pens and pencils are convenient and useful and dealers in stationers' supplies will appreciate the "System" daters illustrated. They fit either the top or point of pencils and the point of fountain pens, the rubber dating stamp being attached to a metal slide.—The R. D. Swisher Mfg. Co., 411 South Clinton street, Chicago, Illinois.

"System" Daters for Pens or Pencils

Improved Bicycle Pedal

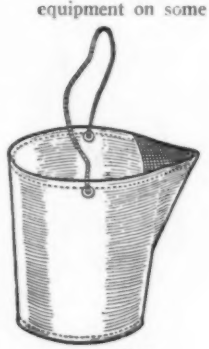
Dealers in athletic goods will appreciate the improved bicycle pedal known as the "Westfield." It is made of aluminum, in one piece, with the pedal rubbers inserted separately. There is therefore nothing to get out of order, and nothing to rust. This pedal is now original equipment on some lines of wheels and may be ordered on others or bought separately.—Westfield Manufacturing Co., Springfield, Massachusetts.



Westfield Bicycle Pedal

Collapsible Folding Pail

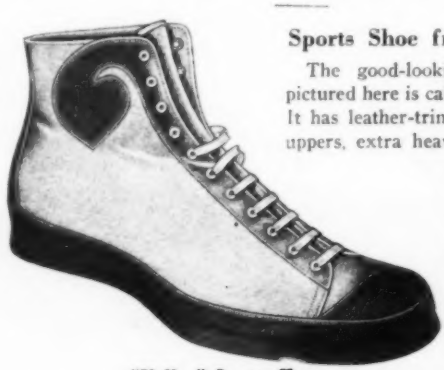
Dealers in auto accessories will find the Burch auto radiator pail a popular item, especially with campers who need a compact water carrier. It is made of waterproof duck, with rope handle, wire frame, and a wire strainer at the nose. It folds into a small roll which may be carried in a pocket of the car.—The F. J. Burch Manufacturing Co., Pueblo, Colorado.



Burch Pail

Sports Shoe from the West

The good-looking sports shoe pictured here is called the "Volley." It has leather-trimmed white duck uppers, extra heavy red fiber-rubber suction soles, "Kendex" insoles, and a patented ankle guard, a conventionalized heart in design. The "Volley" shoe is made by the pressure cure process and laces to the toe.—La Crosse Rubber Mills Co., La Crosse, Wisconsin.



"Volley" Sports Shoe

The Editor's Book Table

Book Reviews

THE ANALYSIS OF RUBBER. BY JOHN B. TUTTLE. AMERICAN Chemical Society Monograph Series. The Chemical Catalog Co., New York, 1922. Cloth, 155 pages, 6 by 9 inches, indexed.

In this volume the author demonstrates his ample qualifications for his task, gained by years spent in rubber laboratory and research work. His excellent monograph will be read with profit by "the chemists in the consumers' laboratories," to whom it is particularly addressed by the author, and by works chemists and rubber technologists generally.

Following the introductory chapter on the purpose of rubber analysis, the succeeding ones in order treat of the composition of crude rubber; preparation of rubber compounds; theory of vulcanization; sampling; extractions; determination of rubber: sulphur determinations; detection of organic accelerators; mineral analysis and special determinations; micro-sectioning and microphotography; and calculations to approximate formulas.

A very full bibliography of papers arranged by authors is given covering research and analytic rubber problems. For the benefit of chemists of limited experience in the technology of rubber three appendices are included, the first on factory processes and the second on physical tests. The third is a table of specific gravities of usual rubber compounding ingredients.

"MARKET FOR RUBBER GOODS IN BELGIUM." BY P. L. PALmerton, chief, Rubber Division, Department of Commerce. Trade Information Bulletin No. 65. Published by Bureau of Foreign and Domestic Commerce, Washington, D. C. Paper, 6 by 9 inches.

Many facts of interest regarding the rubber industry of Belgium appear in this comprehensive bulletin. It is surprising to learn that of the 8,290,000 pounds of rubber goods imported in 1920 the United States supplied only 7 per cent; that the Michelin Company furnishes more than half of Belgium's automobile tires; and that this company, with two others, one of them the French Goodrich company, supply more than 80 per cent of the automobile tire replacement business. On the other hand, American motor cycles enjoy the greatest popularity in Belgium, while American motor cycle tires lead all others.

"GRAPHICAL METHODS." BY WILLIAM C. MARSHALL, M.E., C.E. McGraw-Hill Book Co., New York and London. Cloth; charts and diagrams; 253 pages, 6 by 9 inches, inclusive of bibliography and index.

The non-mathematical person instrusted with making or using charts, diagrams, or graphs for discussing engineering or statistical data will find this text-book a very helpful guide. A wide range of the application of graphical methods to practical problems is given, followed by chapters on calculations, nomography and mechanical records.

BELT CONVEYORS AND BELT ELEVATORS. BY FREDERICK V. Hetzel, M.E. New York, 1922. John Wiley & Sons, Inc. Cloth, 333 pages, 6 by 9 inches, illustrated, indexed.

As the author states in his preface, this is a practical book, explaining the principles and reasons for doing things. Much of the information is new in print and derived from first-hand engineering and manufacturing sources. The volume comprises two sections, as indicated in the title, considered from the engineering standpoint. The chapter on belts and belt manufacture is of interest and value to every manufacturer and user of rubber and canvas belting whether for power transmission or conveying purposes. Many data are given on construction, specifications and tests of belting for conveyor work. Every belting manufacturer will find this book useful for rating and improving his product.

"THE SCHOOL PRODUCT AND INDUSTRY." BY WILLIAM C. Geer, vice-president in charge of development, The B. F. Goodrich Co., Akron, Ohio. Reprinted from the *Educational Review*, Vol. 64, No. 2, September, 1922. Paper, 11 pages, 6 by 9 inches.

An eminent chemist, a noted authority on rubber, and a forceful factor in the industry, Dr. Geer is well qualified to pass an opinion on the working of the modern school system, especially in its relation to industry in general. The two, he finds, do not "hitch" as they should. There is no easy gradation or transition from school to business; there is a gap between the two that should be and could be readily bridged, and industry would gain largely were the two closely linked. Business and industry in general, Dr. Geer believes, could be made more attractive to school boys; they should be trained to be leaders and not mere followers. The remedy, it is pointed out, lies in developing in the school youth the critical faculty, as well as the habit of self application in purposeful activity. As another means for the better fitting of school pupils for industry, Dr. Geer emphasizes the importance of training them in exact, thorough collection and orderly arrangement of data and clear, concise expression in verbal or written reports on problems assigned to them for solution.

Abstracts of Recent Rubber Articles

The Colloid Mill. Two types of machines have been employed, one a disk mill, in which is applied an adjustable pressure to the suspension passing through the disks, a continuous circulation of the milled suspension, and a rapid counter-revolution of the disks at 2,000 r.p.m.

The other is in principle, a "dismembrator" in which the innovations are: (1) the rotating arm-wheel is placed eccentrically toward the base of the containing case so that the material continually falls into the field of action instead of circulating centrifugally outside the arm-wheel range; (2) the reduction of the baffles to the minimum number, two for balance, in order to obtain a maximum force at each; (3) the application of extremely high speeds of revolution.—A. Forster and J. Reilly. *Journal of the Society of Chemical Industry*, October 31, 1922, 435-438 R.

Rubber. A monograph on caoutchouc comprising a review and interpretation of the results of rubber research, with bibliography. Topics: Caoutchouc; raw rubber sols and gels; effect of vulcanization on dispersion; changes in the physical properties due to vulcanization; chemical changes due to vulcanization; correlation of the physical properties and chemical composition, coefficient of vulcanization; the effect of catalysts on the physical properties; reversion of the stress-strain curve; stability of vulcanized rubber; variation in the proportion of sulphur to rubber; effect of mineral ingredients; alternative methods of vulcanization; theories of vulcanization; other reactions of the caoutchouc hydro-carbon; synthetic rubber.—H. P. Stevens in the Fourth Report on Colloid Chemistry and Its General and Industrial Applications. British Association for the Advancement of Science.

Stresses and Wear in Automobile Tires. The wear of an automobile tire is caused by deformations in the inner layers of the tire and by sliding on the road. These two sources of friction develop heat which increases the temperature of the tire. A decrease in the number of layers in building up the tire and a decrease in the coefficient of friction would therefore increase the durability of the tire. Wear is concentrated in two lateral zones of the tire. Properly shaped ribs advantageously reinforce a tire along these zones of wear and provide increased ventilation for reducing the tire temperature.—Otto Enoch, *Der Motorwagen*,

September 10, 20, and 30, 1921. The *Journal of the Society of Automotive Engineers*, November, 1922, 438-443.

Black in Rubber Mixings. The effect of various blacks in test mixings of rubber and sulphur with and without the presence of zinc oxide and litharge are compared. Tabulated results of physical tests show distinct superiority in tensile properties due to American gas black over those obtained by the use of blacks from any other source.—Edward Marckwald and Fritz Frank. *Gummi-Zeitung*, September 29, 1922, 1459-60 and October 13, 5-8.

Scientific Method in Rubber Compounding. [illegible] advanced current practice in what might be termed compound engineering, in which are discussed briefly the problems of the effect of temperature and type of accelerator, practical procedure in compounding, the influence of fillers of active and inert types, the conditions which confront the compounder and the wide range of information he must have available to successfully meet the conditions of service and competition.—C. O. North.—*The Rubber Age*, London, November, 1922.

Application of Hydrogen Sulphide and Sulphur Dioxide Gases Direct to Rubber Latex. The gases under these conditions merely dissolve in the serum and react and form molecular sulphur and do not vulcanize the rubber globules.—H. P. Stevens. *Bulletin of the Rubber Growers' Association*, 1922, 4, 386-387.

Chemical and Mechanical Tests of Rubber Insulation.—A. van Rossem. *De Ingenieur* (Netherlands), May 28, 1921; *Elektrotechnische Zeitschrift*, 1922, 43, 392-3.

Note on the Comparative Accelerating Effect of Dimethyl Dithiocarbamate of Dimethylamine and of Diethyl Dithiocarbamate of Diethylamine. The vulcanization of mixtures of rubber (100) and sulphur (8) with and without the addition of zinc oxide (10) at 286 degrees F. showed that dimethylamine dithiocarbamate (0.25) and its diethylamine analog are of comparable effectiveness in the absence of zinc oxide. In the presence of zinc oxide the dimethylamine compound is distinctly the more active.—P. Schidrowitz, J. M. S. de Gouvea, and F. G. Osborne. The *India-Rubber Journal*, 1922, 64, 75—77.

New Trade Publications

"MALTESE CROSS RUBBERS" IS A NEW 1922-1923 CATALOG ISSUED by Gutta Percha & Rubber, Limited, Toronto, Canada, illustrating all grades of men's and women's rubber footwear. The styles pictured range from the heaviest boots and shoes for lumbermen and hunters to the lightest and most carefully shaped types of women's footwear, made of the highest grade of rubber. Another booklet published by the same company is entitled "'Gutta Percha' Outing Shoes," and shows many varieties of footwear suited for outdoor sports.

AN ATTRACTIVE AND WELL-ILLUSTRATED BULLETIN, ISSUED BY THE Firestone Tire & Rubber Co., Akron, Ohio, sets forth various types of Firestone truck tire equipment, including pneumatic and cushion tires, both for light and heavy vehicles. Attention is called to the company's pioneer work in the truck tire field, its important contributions to the Good Roads movement, and the Ship-by-Truck method of transportation.

AN INTERESTING COMPILATION, PREPARED AS A SUPPLEMENT TO A previous volume, entitled "Markets of the World," is being issued by The First National Bank of Boston, Boston, Massachusetts. The series now appearing comprises several commercial maps, and certain statistical data regarding rubber and other industries, and natural resources of the United States and Canada, the whole forming a work of unusual interest. While prepared especially for the use of the sales manager, the publication will be found to be of value also to the average business man, as the information it conveys is very conveniently presented. The supplement has been published in loose-leaf form.

Foot-Prints, VOLUME X, NO. 2, FOR SEPTEMBER, 1922, IS THE "Fleet Foot" catalog for 1923, issued by The Canadian Consolidated Rubber Co., Limited, Montreal, Canada. It displays many illustrations of attractive types of sport shoes, suited for men, women, and children.

THE VARIOUS CHARACTERISTICS OF SILURIUM, A PRODUCT OF THE Silurium Manufacturing Co., Cleveland, Ohio, are given in an illustrated bulletin entitled "Silurium in the Manufacture of Battery Cases." This material has been found to undergo successfully various tests recommended by storage battery manufacturers.

Interesting Letters from Our Readers

The Five-Day Week

TO THE EDITOR:

DEAR SIR: Neither the protest of the workmen nor a desire to make the workingman's lot easier are as much responsible for the passing of the sixty-hour week as the fact that it proved inefficient both in point of quantity and quality of goods produced. Employers of labor have been giving serious thought to hours of employment and working conditions, as there exists abundance of proof that both have a decided bearing upon production cost.

There are three distinct schools of thought applying to number of hours of employment. One favors five 10-hour days and 5 hours on Saturday, or a total of 55 hours for the week. Another advocates 6 days of 8 hours each or 48 hours per week, and the third five 9-hour days and 5 hours on Saturday or a total of 50 hours per week. The largest and most efficient producer of motor cars has recently adopted a 5-day week.

The 5-day week I am convinced will prove desirable, practical and economical in many industries and I have especially in mind the tire industry, having adopted the week of 5 days of 10 hours each early in March, 1921, and the results have fully equalled if not surpassed expectations. The expense of starting, which is costly in the tire business, is eliminated as it applies to one day for each week, and too, it is practically impossible to get the benefit of a full half day on Saturday as the workmen gradually slacken their pace and do little work after eleven o'clock. Experience has demonstrated that employes appreciate the full day during the week when it can be arranged to afford enough hours of employment at a fair rate of pay to produce a reasonable week's wage.

Ten hours employment in a day is too long under many conditions and especially with a 6-day week, but one year's experience operating five 10-hour days in the week has proved that the rest from Friday night until Monday morning more than compensates for the extra length of day and any resulting fatigue.

I am opposed to night work and question if it is justified even as an excuse for increasing the volume over which the overhead and fixed charges may be spread. Night work is especially undesirable in tire making since the quality of the product can be adversely affected by any one of many operations improperly done. And, as tires are driven to destruction, the average service from a given make of tire will ultimately affect the reputation and salability of any product.

The tire industry seems to have formed the habit of reckoning plant capacity upon the basis of continuous day and night operations. This is due undoubtedly to the fact that for five or six years prior to 1920 the constantly increasing demand for tires made day and night operation of the plants necessary, regardless of results, and it seems difficult for the makers of tires to adopt any other basis of figuring capacities. There is probably sufficient demand for tires to keep all practical and experienced tire makers well employed throughout the year, operating 50 hours per week, and the net results will probably be more satisfactory than under present conditions.

Engineers Club, New York, N. Y. H. O. SMITH.

News of the American Rubber Trade

Financial

Goodyear Tire & Rubber Co. of Canada, Limited

NET profit for the year ended September 30, 1922, after setting up a reserve of $406,875 for plant depreciation, was $1,062,023, making the surplus on that date $1,462,912. The cash balance was $1,236,535, exceeding current liabilities by nearly $300,000. Current liabilities were $945,418 against current assets totaling $5,013,216, of which $2,385,844 represented inventories and $1,437,946 represented accounts receivable. During the year the firm has prepaid $785,373 of its three-year renewable 8 per cent notes, reducing the balance to $404,546. Dividends have been paid on the 7 per cent preferred stock to December 31, 1920, but none to date on the 6 per cent prior preference stock issued in 1921 and 1922.

Dividends Declared

COMPANY	STOCK	RATE	PAYABLE	STOCK OF RECORD
Boston Woven Hose & Rubber Co.	Com.†	$1.00 ..	Dec. 15	Dec. 1
Boston Woven Hose & Rubber Co.	Pfd.	$3.00 ..	Dec. 15	Dec. 1
Brunswick-Balke-Collender Co.	Com.	1¾% q.	Nov. 15	Nov. 5
Firestone Tire & Rubber Co., The.	7% Pfd.	1¾% q.	Nov. 15	Nov. 1
Goodrich, B. F., Co., The	Pfd.	$1.75 q.	Jan. 2	Dec. 22
Goodyear Tire & Rubber Co. of Canada, Limited	Pfd.	1¾% q.	Jan. 10	Dec. 31
Goodyear Tire & Rubber Co. of Canada, Limited	Pri.Pref.*	1½% q.	Jan. 10	Dec. 31
Paramount Rubber Consolidated, Inc.	Pfd.	1¾% q.	Nov. 2	.....
Tillinghast, B. C., Rubber Co., Inc., The	Com.	1½% q.	.....	Oct. 1

†On 86,000 shares, no par value, at rate of 8% per annum on old stock.
*Also accrued dividends cumulative since January 1, 1922.

New York Stock Exchange Quotations

November 25, 1922

	High	Low	Last
Ajax com.	12½	12	12¼
Fisk com.	11⅝	11½	11⅝
Goodrich com.	30⅝	30⅛	30⅛
Goodrich pfd.	80½	79¾	79¾
Kelly-Springfield com.	41½	40	40½
Lee com.	25	25	25
United States Rubber com.....	48¼	47	48
United States Rubber 1st pfd.	94¼	94	94

Akron Rubber Stock Quotations

Quotations of November 21, supplied by App-Hillman Co., Akron, Ohio, were as follows:

	Last Sale	Bid	Asked
American com.....	15	..	15
American pfd.....	70	..	70
Amazon com.....	5	..	4
Firestone com.....	73	72½	73
Firestone 6% pfd.....	97½	97½	98
Firestone 7% pfd.....	89	88½	90
General com.....	250	260	300
General 7% pfd.....	97	97	100
Goodrich 6½'s.....	101	100¾	101½
Goodyear com.....	10	10	10½
Goodyear 7% pfd.....	26½	26	27
Goodyear prior pfd.....	62	60½	61½
Goodyear 1st mtg.....	116	115½	116½
Goodyear deb.....	98	97½	98¾
India com.....	80	78	81
India 7% pfd.....	83	79	85
Mason com.....	7	6½	7½
Mason 7% pfd.....	47	47	49
Marathon	2¾	2	3
Miller com.....	70	65	70
Miller 8% pfd.....	99	98¼	99
Mohawk com.....	10	11	14
Mohawk 7% pfd.....	70	70	75
Rubber Prods.....	35	19	25
Seiberling com.....	6	6	6¾
Seiberling 8% pfd.....	40	38	43
Star com.....	25	..	25
Star 8% pfd.....	..	..	80

New Incorporations

Acme Tire Co., October 4 (California), $100,000. S. Freeman; H. Sapper; H. C. Reyneau, secretary. Principal office, Polk and G. G. avenue, San Francisco, California. To deal in tires and automobile accessories.

C. & P. Tire Co., Inc., November 2 (New York), $5,000. P. S. Potter, 45 College avenue; C. J. Drake and F. S. Quinterro, both of 45 Market street, all of Poughkeepsie, New York. To manufacture tires, etc.

Commercial Tire Corporation, September 26 (Indiana), $75,000. H. H. Bieber; C. P. Squires; M. M. Hathaway, all of Fort Wayne, Indiana. Principal office, Fort Wayne, Indiana. To manufacture and deal in automobile tires and supplies.

Conservite Co., The, October 4 (Ohio), $50,000. H. F. Porter; P. H. Wilkinson; C. A. Hope; W. Eberly; L. A. Pickering. Principal office, Cleveland, Ohio. To deal in tires, tubes and accessories.

Culp, George K., Inc., September 18 (Maryland), 11,000 shares without par value, all common. G. K. Culp and W. DeVore, both of 55 West 44th street; S. Galoppo, 120 West 31st street, all of New York City. Principal office, 101 East Fayette street, Baltimore, Maryland. To manufacture, buy, sell, repair, rebuild, import, export and generally deal in tires of all kinds and description.

Hatfield Rubber Works, November 1 (New Jersey), $250,000. A. L. Hatfield, 1445 Munn avenue, Hillside, New Jersey; L. and A. Beller, both of 92 Academy street, Newark, New Jersey. Principal office, 92 Academy street, Newark, New Jersey. To manufacture molded rubber goods.

Instant Tire Service Co., The, October 21 (New York), $5,000. R. W. Fleming, secretary; D. E. Carson, president; P. E. Waxler, treasurer. Principal office, 75 Henry street, Binghamton, New York. To retail tires, accessories and rubber goods.

Interstate Rubber Co., Inc., November 11 (New York), $20,000. G. and A. Andino; J. E. Conklin, all of 117 West street, New York City. To deal in rubber goods.

Lyman Manufacturing Co., September 5 (Ohio), $1,000. K. and G. Lyman; M. L. Hogan; D. L. Hurlbutt; W. G. Benedict. Principal office, Cleveland, Ohio. To manufacture rubber goods.

Maguire, T. A., & Co., Inc., November 15 (New York), $250,000. R. J. Scully; J. D. Van Cott, both of 24 Broad street; T. A. Maguire, 290 Broadway, all in New York City. To deal in crude rubber.

Medina Rubber Co., September 22 (Ohio), $25,000. H. C. Keck, president; S. E. Johnson, secretary and treasurer; D. R. Pelton, vice-president; G. F. High, assistant secretary and treasurer. Principal office, Medina, Ohio. To manufacture tires and tubes. Manufacturers of "Keck Safety Boots."

National Tire Rebuilding Co., November 6 (Delaware), $25,000. T. L. Croteau; M. A. Bruce; C. H. Blaske, all of Wilmington, Delaware; W. B. Secrist, attorney, 1404 Union Bank Building, Pittsburgh, Pennsylvania. Delaware agent, Corporation Trust Company of America, DuPont Building, Wilmington, Delaware. To deal in automobile tires and all articles of which rubber may be a component part.

Native Rubber Co., The, October 11 (Ohio), 250 shares, no par value. M. W. and J. C. Spear; J. M. Binns; E. M. Holat; J. Kohman; Principal office, 332 Bulkley Building, Cleveland, Ohio. To manufacture tires, rubber goods and compounds.

Quincy Tire Outlet Co., Inc., October 24 (New York), $10,000. J. Brenner; B. Goldman; A. Savarese, all of 41 Park Row, New York City. Principal office, Brooklyn, New York. To deal in automobile tires.

Reis Rubber Products Co., Inc., November 10 (New York), $100,000. A. L. Berman; A. S. Wechsler; E. Tumin, all of 346 Broadway, New York City. To manufacture rubber products.

States Tire & Rubber Co., The, September 5 (Ohio), $10,000. W. J. Moffett; E. J. Lynch; A. W. Shea; F. M. Hackett. Principal office, Toledo, Ohio. To deal in tires and tubes.

Titeflex Metal Hose Co., October 6 (New Jersey), 5,000 shares of no par value. C. W. Fletcher, president; R. H. Stone. Principal office, Badger avenue and Runyon street, Newark, New Jersey. To manufacture metal and rubber hose and full and semi-interlocked tubing.

Wear Ever Patch Manufacturing Co., The, September 27 (Ohio), $10,000. D. A. and S. A. Rosenfeld; R. E. and E. E. Shaffer; F. Spira. Principal office, 218 East Long street, Columbus, Ohio. To manufacture rubber patches for tubes.

Welton, P. E., Engineering Co., The, September 1 (Ohio), $50,000. P. E. Welton, president and general manager; G. W. Wadsworth, vice-president; J. W. Tyrrell, secretary and treasurer; A. S. Mottinger, attorney. Principal office, 46 South Broadway, Akron, Ohio. To do engineering, covering civil, architectural, electrical, mechanical and chemical engineering, specializing in rubber plant service. (Formerly The Akron Engineering Co.)

Wolfe & Lang Inc., July 10 (New York), $50,000. A. Wolfe; H. E. Lang. Principal office, 27 East 21st street, New York City. To manufacture garters, hose supporters, fancy elastic webs, sanitary goods and other notion items.

Wood, Charles E., Inc., November 11 (New York), $20,000. C. E. Wood, president; J. R. Wood, secretary and treasurer. Principal office, 287 Broadway, New York City. To deal in crude rubber.

M. & A. M. A. Membership Increases

More than 415 companies are now included in the membership of the Motor and Accessory Manufacturers' Association, 250 West 57th street, New York, N. Y., according to M. L. Heminway, general manager. The number of parts and equipment makers now listed on the association's roster is greater than ever before in the eighteen years of this organization's service to the automotive industry, while new concerns are being admitted to membership each week.

The Rubber Trade in the East and South

Manufactured Goods—New York

The demand for manufactured rubber goods continues to be good in all lines. With the exception of tire and inner-tube production which is running under normal in some degree, other lines are being produced at essentially capacity figures particularly in mechanical goods. Heel factories are well occupied but unfortunately on a very close margin of profit due to closeness of competition, the benefit of which, however, fails to reach the consumer.

The record production of automobiles is reflected for the rubber industry in corresponding activity of the auto topping output. Insulated wire mills are well supplied with orders for railway signal and building needs. Footwear, weatherproofed clothing, druggists' sundries, novelties, etc., all show a satisfactory volume of production.

New York

Wolfe & Lang, Inc., 27 East 21st street, New York, N. Y., has a modern factory equipped with new machinery of the latest design for the manufacture of men's, women's, and children's garters and hose supporters, fancy elastic webs, sanitary goods, and other notion items. The directors are Albert Wolfe and Harry E. Lang, both well known in the notions trade. The new company was incorporated last July with a capitalization of $50,000. The department store and jobbing trade are the chief outlet for the company's products.

The Siola Rubber Manufacturing Co., Inc., has removed its executive offices from 103 Park avenue, New York, N. Y., to its new mill at 84 Forrest street, Brooklyn, N. Y. Another mill is operated at Northport, New York, and the company specializes in sheet rubber, spread and calendered fabrics, and molded rubber goods. It also does compounding and mill and calender work.

L. D. Bigelow, formerly connected with the United States Rubber Co., Cleveland, Ohio, is the new general manager of the New York Rubber Co.'s plant at Beacon, New York.

The usual monthly meeting of the American Section of the Society of Chemical Industry, to be held at Rumford Hall, 52 East 41st street, New York, has been postponed from December 1 to December 15. The evening will be devoted to papers dealing with some of the chemical or physical aspects of photographic science, with special reference to the uses of photography and motion pictures in the industries. Members of the Technical Photographic and Microscopical Society are invited to attend.

Due to lack of funds for carrying forward enlarging operations, The Syracuse Rubber Co., Inc., Syracuse, New York, has been compelled to accept a friendly receivership in equity for the purpose of a reorganization, which will soon be completed. There is an increasing demand for the company's "Syra-Cord" tires, and the factory and various sales agencies will continue work as usual, while the receiver, William F. Rafferty, will operate with the old management. The company's assets in excess of liabilities are estimated at $360,000. J. B. Losey is general manager.

The Benzine Condensation Co., Inc., 220 West 42nd street, New York, N. Y., manufacturer of solvent recovery apparatus for the rubber trade, announces a new selling policy based on a leasing plan. Machines will be installed and maintained in repair by the company whose only remuneration will be a percentage of the money saved by the use of the machines.

At a recent meeting of the committees representing the debenture holders, note holders and general creditors of the Habirshaw Electric Cable Co., Inc., 10 East 43rd street, New York, N. Y., a plan for reorganization of the company was approved. The following will constitute the reorganization committee: E. A. Potter, Jr., E. N. Potter, F. J. Leary, T. K. Stevenson, and T. E. Quisenberry.

The Union Sulphur Co., 33 Rector street, New York, N. Y., has purchased a large sulphur deposit, said to contain 14,000,000 tons of this substance, at Damon, Texas, and will begin in a few months the development of an extensive plant for its production. Officials of this company include: Harry D. Whiton, president; Erskine Hewitt, vice-president; Clarence A. Snider, secretary and treasurer; Wilbur X. Wilkinson, assistant secretary and manager of sales; and John R. Gordon, traffic manager.

Pennsylvania

One of the newest entrants into the field of rubber manufacture is the Armstrong Cork Co., Lancaster, Pennsylvania, known for many years as a manufacturer of linoleum and cork products. After three years of testing and experimentation, it has now gone into the rubber heel business and has erected a modern plant for the purpose, equipped with the latest machinery and systematic operation to produce a large number of heels daily. The "Circle A" heel, which the Armstrong Company is manufacturing, will be described in a later issue.

The Allen Tire & Rubber Co., Allentown, Pennsylvania, has elected the following officers: Wilmer Dunbar, reelected president; Tom S. Johnson, secretary and treasurer, succeeding J. T. Leathers as treasurer; and M. M. Waterbor, assistant secretary and assistant treasurer. J. T. Leathers, above, and A. C. Leathers, formerly vice-president, have resigned and are now only stockholders in the company.

Rhode Island Notes

An evidence of the general improvement in business that has taken place among the manufacturing rubber concerns of Rhode Island in the past few weeks is to be seen in the increased number of advertisements that have repeatedly appeared in the daily newspapers during the past month calling for additional help. While expert operatives are always desirable and can find employment, a significant feature of these advertisements is the call for young women to learn the work. This demand for inexperienced help is not confined to any one concern, or to any specific line but appears to be general, and there is evidently room for more, as the advertisements continue to appear day after day.

Announcement was made a few days ago that George Schlosser, for many years connected with the United States Rubber Co., through its various plants and subsidiaries in Rhode Island, has been named general manager of the footwear and miscellaneous divisions of the United States Rubber Co. Mr. Schlosser has for some time been a vice-president of the Woonsocket Rubber Co., a footwear division of the United States Rubber Co.; president of the National India Rubber Co. at Bristol and general factory manager of the plants in Woonsocket and Bristol. Mr. Schlosser's promotion comes as the result of the resignation of Myron H. Clark who, for some time, has been general manager of the footwear and miscellaneous divisions of the rubber corporation.

Plans have been completed for the erection of an addition to the power house at the plant of the Phillips Insulated Wire Co., Pawtucket, which is to cost in excess of $20 000. The new addition is to be of brick and concrete construction and is to be 65 feet in length by 28 feet in width. This will be equipped with modern machinery and considerable new machinery will be installed in the other parts of the plant, thereby greatly increasing the facilities and production of the concern.

The Lawrence Felting Co., Millville, has been operating in several of its departments until 9 o'clock every evening during the most of the past month in order to catch up with some of the rush demands.

The Comet Rubber Co., Inc., Providence, has been incorporated under the laws of Rhode Island for the purpose of dealing in rubber goods, with an authorized capital of $200,000. The incorporators are Harvey F. Mitzel and Michael J. Lynch of Providence and M. Walter Flynn of Westerly, Rhode Island.

Wayne D. Bradley, chief chemist at the Woonsocket Rubber Co., has been granted a two months' leave of absence.

The South

The Holtite Manufacturing Co., Warner and Ostend streets, Baltimore, Maryland, manufacturer of Jax and Holtite rubber heels, has plans out for its new addition on which it expects to award the bid at an early date. The addition will permit approximately 80 per cent increase in production. The officers of the company are: Morris Eisen, president; Harry Trager, vice-president; Albert A. Esterson, secretary-treasurer.

Callaway Mills to Produce Tire Fabrics

According to present indications, tire fabric production on a substantial scale may be carried on by the Athens Manufacturing Co., Athens, Georgia, one of the factories now forming part of the Fuller E. Callaway chain of cotton mills. At the Athens plant new tire fabric machinery has been recently installed, while the present capacity of the establishment, limited to about 50,000 pounds of cord fabric a week, will be greatly increased in the near future, it is said. This mill is now producing high grade carded peeler cord fabric, as well as 18 to 32 single and two-ply weaving yarns, which will be marketed by Callaway Mills, Inc., as sales agent.

Mr. Callaway, president of the entire organization, is optimistic regarding the automotive industry, but believes that both the automobile and tire fabric trades are at present undergoing a "weeding-out" process that will leave them more stabilized and better prepared to meet the exigencies of the future.

The Rubber Trade in New Jersey

Manufactured Goods

The usual monthly advice as to trade conditions in the local rubber industry may seem to be rather conventional repetition than an actual statement of facts. Investigation among the various factories discloses, however, that they all continue actively engaged, and it is safe to estimate that the industry as a whole is operating upon an 80 per cent basis of maximum production at this time. The inflow of new business, it is true, is not equal to the volume shown a month or two months back, but it is still very satisfactory.

The rubber reclaiming plants are welcoming the advance in the price of crude rubber as it means increased activity in reclaiming and increased demand for the product.

Tire manufacturers continue to enjoy good business and some of the plants are operating on the same production bases as during the spring and summer months of this year.

All the mechanical rubber goods mills have sufficient business booked for future delivery to insure almost capacity operation for several months to come. Prices in this line are stiffening materially because of the substantial advance in prices of crude rubber and cotton goods of all kinds.

Labor costs are increasing slightly and the average cost of fuel supply for the current year will show a high average. All these make for higher prices, and the buying trade seems to be more closely in touch with the situation than heretofore, so it purchases almost every time in anticipation of manufacturers' price advances.

Trenton

The Acme Rubber Manufacturing Co., Trenton, recently filed certificate in the office of the Secretary of State of New Jersey, and was granted permission to increase its capital stock to $2,000,000. It is said that a substantial stock dividend has been declared. All indications point to this company enjoying a prosperous business which is not surprising in view of the well-merited reputation it has established for the quality of its product.

E. H. Thiemeyer, for many years in charge of the St. Louis store and business of the Acme Rubber Manufacturing Co., Trenton, passed away very suddenly on October 28. Mr. Thiemeyer had been in usual good health, but in the morning soon after arising to dress for his day's business, he was stricken with apoplexy and lived only a few hours. He will be succeeded by his son, Ernest E. Thiemeyer, who has already taken charge of the Acme Rubber Manufacturing Co.'s affairs. The store and office organization at St. Louis will not be changed.

The Spartan Tire & Rubber Co., which is operating the plant formerly owned by the Zee-Zee Rubber Co., reports having reached the peak of production last week, 1,000 tires, with inner tube production of twice this number. Karl Kavanaugh, formerly with the Ajax Rubber Co., is superintendent and production manager.

The annual football game between Princeton and Yale was witnessed by almost all of the officers and executives of the rubber manufacturers of Trenton, many of whom are graduates of Old Nassau. Among those who helped in the Princeton cheering section were: A. Boyd Cornell and Henry N. Young, of the Hamilton Rubber Manufacturing Co.; Charles E. Stokes, of the Home Rubber Co.; Bruce Bedford and Dudley Wilson, of the Luzerne Rubber Co.

The United & Globe Rubber Co., Trenton, is operating two shifts of men in all the mechanical goods departments, while one shift is running the tire department. The company has good sized orders in the cotton and molded hose departments.

The Essex Rubber Co., Trenton, is busier now than it has been for a long time. The heel and sole departments are being operated both night and day. The company has a number of big orders on hand.

Clifford H. Oakley, president of the Essex Rubber Co., Trenton, is deeply interested in Boy Scout work in Trenton and devotes much of his time to it. He has been active in the work for some time.

The Semple Manufacturing Co. has taken over the plant of the Sanhican Rubber Co., at Brookville, a suburb of Trenton, for the purpose of manufacturing inner tubes and other rubber products. The company was incorporated with $100,000 capital. Charles H. Semple, who was head of the defunct Semple Rubber Co., is president of the new concern. The other incorporators are George T. Nutt, of Asbury Park, and Lula Mathews, of Trenton. William B. John, who was head of the Sanhican Rubber Co., is also affiliated with the new concern.

A. T. Fitzgeorge and A. F. Jensen have opened the Tire Shop at 18 South Montgomery street, Trenton, and are handling Acme products exclusively—Red Letter cord and fabric tires. The new concern announces that free repairs will be made with all products.

Fifty representatives of the Ajax Rubber Co., Trenton, recently held an all-day conference and luncheon at the Stacy-Trent Hotel for the purpose of discussing trade conditions and arranging new business for the coming season.

John V. B. Wicoff, receiver of the Semple Rubber Co., Trenton, will shortly offer the plant for sale. It was run for a while by the receiver and closed after the stock had been used up. The company manufactured automobile tubes exclusively.

The Bergougnan Rubber Corporation, Trenton, recently announced an increase of 12½ per cent on the price of its cord and fabric tires and tubes, the increase to take effect immediately. It is stated that this change was caused by the greater cost of production, due to the rise in price of rubber and fabric. The Bergougnan plant is now working at full capacity, and the company

is finding it difficult to manufacture its new "Gold Seal" cord model in sufficient quantities to meet the demand.

New Jersey Notes

In the United States District Court Judge Joseph L. Bodine recently named William L. Brumyate, of Newark, New Jersey, receiver for the Smith Rubber & Tire Co., Saddle River, New Jersey, as the result of an involuntary petition in bankruptcy filed by counsel for a number of creditors. The Federal Court prohibits in its order any action through the New Jersey Court of Chancery.

The Titeflex Metal Hose Co., Newark, New Jersey, recently filed articles of incorporation with the Secretary of State at Trenton. The company proposes to issue 5,000 shares of stock without par value. It will engage in the manufacture of metal and rubber tubing and hose. The incorporators are R. H. Stone, W. K. Herbert and C. W. Fletcher, 297 Badger avenue, Newark, New Jersey.

The Old Hickory Tire Co., with a $3,500,000 organization in New Jersey, a $500,000 organization in Maryland and a $2,000,000 organization in Delaware, and which owns a six-acre tract at Hillside, New Jersey, is in financial difficulty. The Maryland company was organized September 16, 1919, the New Jersey company on December 1, 1920, and the Delaware corporation on November 4, 1921. The Maryland corporation purchased a six-acre tract at Hillside, New Jersey, at a cost of $24,000 and was to build a large factory, which project never was carried out. Federal Judge Lynch has ordered the three companies to show cause why a receiver should not be appointed.

The Hatfield Rubber Works, Inc., Newark, New Jersey, has been incorporated with $250,000 capital to manufacture and deal in molded rubber goods and rubber for the insulation of wires. Louis Beller is named as the agent in charge and the principal office of the company will be at 92 Academy street, Newark. The incorporators are Andrew L. Hatfield, Hillside, New Jersey, and Louis Beller and Abraham Beller, both of Newark.

Harry H. Swallow has been advanced to the position of purchasing agent of the Lambertville Rubber Co., Lambertville, New Jersey. He has been in the employ of the company for the past twenty-three years and held various positions with the concern.

The Manhattan Rubber Manufacturing Co., Passaic, New Jersey, has registered the trade mark "Browndel" for asbestos brake lining.

Morris Pearson Joins De Mattia

After December 1, Morris A. Pearson will be associated with De Mattia Bros., specialists in tire building equipment, Garfield, New Jersey.

Morris A. Pearson

Mr. Pearson's experience covers about twenty-five years as a mechanical engineer in the rubber machinery trade, where he has many valued friends who recognize his exceptional knowledge of plant layout and equipment. For fourteen years he was with the Farrel Foundry & Machine Co., resigning in 1912 to join an Akron, Ohio, manufacturer in order to gain a more practical knowledge of the mechanical needs of the trade. Following this experience he was identified for a time with Turner, Vaughn & Taylor Co., and more recently with the Allen Machine Co.

In the past few years he has designed the complete mill and calender equipment for many tire and other factories. He is a member of the American Society of Mechanical Engineers and has contributed valuable articles to THE INDIA RUBBER WORLD.

The Rubber Trade in Massachusetts

Manufactured Goods

With few exceptions most Massachusetts rubber plants are busy, with seasonal declines less than normal because of generally low stocks. Rubber footwear business is now very brisk and factory production is increasing as fast as the labor supply will permit. Most of the firms in this district have been advertising for extra help in order to increase their tickets on four-buckle gaiters. Tire and tube production continues above anticipation, due to the exceptionally long driving season and the remarkable sale of new motor cars, which has also maintained the automobile topping demand. On the other hand, the fine autumn weather has adversely affected the sale of waterproof clothing and druggists' sundries, although seasonal stock replenishing has been going on.

Mechanical rubber goods of all kinds are active, especially hose and belting for railway equipment. The building boom increases with a corresponding demand for insulated wire. There is no abatement in the rubber and fiber heel and sole trade, and new brands are constantly appearing on the market. The demand for hard rubber specialties is satisfactory and an increase in radio parts has been noted.

The Rubber Footwear Situation

At a meeting of the Massachusetts Retail Shoe Merchants' Association held late in October, John G. Magaw, Boston branch manager of the Hood Rubber Products Co., Inc., Watertown, spoke on the rubber footwear situation, his remarks in the main summarizing the consensus of opinion in the New England rubber footwear district.

Briefly, he said that for the past two years there has been little business in men's rubber boots owing to the large amount of government boots on the market. These are about gone and this line is picking up again, a big Christmas trade in boys' and girls' sizes also being expected. The bulk of rubber footwear sales for everybody, however, is expected to be in four-buckle gaiters, due to the popularity of low shoes and cut-out styles for women. Novelty gaiters for women, especially Russian boots, are not expected to survive the season because they afford insufficient protection and are losing their appeal through the advent of longer skirts.

Production costs are increasing and indications are that price tendencies will probably be upward after January 1. Retail, wholesale and factory stocks of rubber boots and shoes are low and if we have a normal winter there will be a scramble for goods after the active selling season opens.

Boston

William A. North, former Boston branch manager of the United States Rubber Co., has been appointed general manager of footwear sales, succeeding William F. Enright, who has relinquished his post because of ill health. Following a rest Mr. Enright will take up other work for the company.

The Boston Woven Hose & Rubber Co. is constructing at its Cambridge plant a new one-story press room building 82 by 43 feet to accommodate five presses for its molded hose department, which has outgrown its present facilities. A complete new line of mills and refiners, also considerable machinery in various departments, has recently been installed and numerous office rearrangements made.

Frederic C. Hood, vice-president of the Hood Rubber Co., and president of Hood Rubber Products Co., Inc., Watertown, Massachusetts, addressed the Executives' Club at the rooms of the Engineers' Club, Boston, November 7, on "How the Hood Rubber Co. Is Managed." Mr. Hood described his theory of organization, the system of job analysis and salary adjustment, the plan of employes' liability insurance, the departmental reports, and other characteristic management features of his company in a concrete style which

stimulated a flood of questions from the industrial executives present. Ownership of seventy per cent of the common stock of the Hood Rubber Co. by its employes and their families binds together the interests of the company and its workers, he said.

The Franklin Rubber Co., manufacturer of rainproofs and dealers in other rubber goods, 124 Federal street, Boston, celebrated its fortieth anniversary early this month. During that week all purchasers received souvenirs. The firm was organized at 13 Franklin street as Fuller, Leonard & Small, all of whom are now dead. The firm was incorporated in 1901 as the Franklin Rubber Co. and moved to 105 Summer street. It has been at its present address since 1914. Asa C. Merrill is president and Lorin L. Fuller, treasurer.

F. G. O'Reilly has been appointed New England district sales manager of the Carlisle Tire Co. with headquarters at 784 Commonwealth avenue, Boston. J. W. Roberts is in charge of the service department. Both are well known to the trade in this territory. A direct service from maker to user will be operated.

C. B. Peschmann, who has recently resigned the Cleveland branch managership of The Goodyear Tire & Rubber Co. to accept the position of manager of the eastern sales division of The Denman-Myers Cord Tire Co., has had much experience in the rubber industry. He will make his headquarters in Boston, Massachusetts.

Massachusetts Notes

All of the 52 spaces allotted to New England at the Convention Exposition of the National Shoe Retailers' Association, to be held in Chicago, Illinois, from January 8 to 11, inclusive, have been applied for and 45 firms will be represented. The concerns manufacturing rubber footwear, heels and soles are the Avon Sole Co., of Avon; Cambridge Rubber Co., of Cambridge; and Hood Rubber Products Co., Inc., Watertown. Major Charles T. Cahill, of the United Shoe Machinery Corporation, heads the committee in charge of the New England section.

The Firestone-Apsley Rubber Co., of Hudson, Massachusetts, is now making a line of rubber heels, and J. A. Sheridan, formerly of The Goodyear Tire & Rubber Co. and later of The Firestone Tire & Rubber Co., will sell them in New England's north shore territory.

According to the Worcester County Safety Council, the Curtis & Marble Machine Co., textile machinery manufacturers, of Worcester, was one of the three plants of that city which operated during September without an accident.

The United States Rubber Co. has announced the appointment of George Schlosser as general manager of footwear and miscellaneous factories of the company, effective immediately. Mr. Schlesser succeeds Myron H. Clark, who resigned to take a position elsewhere. Mr. Schlosser is one of the oldest employes of the company and is one of the numerous high officials of the company who began his career in the rubber business 40 years ago as an office boy. He is widely known in footwear circles and is generally recognized as one of the outstanding figures in rubber manufacture in this country.

Warren McPherson, president of the Cambridge Rubber Co., Cambridge, Massachusetts, has recently returned from a hasty trip to Europe in connection with the more extensive marketing of his firm's products abroad.

Frank W. Hodges, foreman of the light rubber shoe making department, has left the Converse Rubber Shoe Co. to engage in the rubber heel business on his own account at Lewiston, Maine. Thomas F. Fyfe, formerly with the Firestone-Apsley Rubber Co., Hudson, succeeds him.

The Converse Tire Co., Malden, has adopted a regular tire production budget which will in great measure offset seasonal variations in supply and demand. Output has been increased 30 per cent and will shortly be increased to 50 per cent.

Tyer Rubber Co. Elects New Executives

The Tyer Rubber Co., Andover, Massachusetts, is planning to begin the manufacture of rubber footwear in addition to its lines of druggists' sundries and automobile tires. At a directors' meeting recently held, Myron H. Clark was elected president, Frederick H. Jones vice-president, and Walter E. Piper treasurer.

Mr. Clark was formerly factory manager of Goodyear's India Rubber Glove Manufacturing Co. and Goodyear's Metallic Rubber Shoe Co., both of Naugatuck, Connecticut, and later was general manager of the footwear and miscellaneous factories of the United States Rubber Co.

Mr. Piper was formerly manager of the Boston Rubber Shoe Co. factories in Malden and Melrose, Massachusetts, and during the war was in charge of purchasing rubber footwear for the United States Army at Washington, D. C.

Mr. Jones has been associated with the company for many years and succeeded John H. Flint as treasurer in 1914.

The Rubber Trade in Ohio

Manufactured Goods—Akron

The evenness of all rubber production which has characterized the industry for more than six months continues unabated with slight increases, either registered or prepared for, in some departments. Tire production has continued practically constant during the past quarter at about 100,000 tires a day. Most of the large plants are planning for slight increases between now and the beginning of the year. Truck and bus tire sales continue to show improvement with the increasing use of trucks for short hauls made necessary by the inability of railroads to handle traffic. All factories making mechanical goods report a seasonal increase in addition to the good business which has been enjoyed heretofore. A slight decrease will be expected during the latter part of December and the early part of January because of the inventory period and the efforts on the part of dealers to avoid taxes. Garden hose, steam hose and axle belting for railroads probably have been the leaders in the forward movement during the past month. The shoe business appears excellent, and increased activity is noted in these departments. It is generally conceded that a shortage will be experienced in footwear during the coming winter as has been the case in previous years because dealers did not lay in sufficient supplies. Some mail orders are already being received in this line as well in other lines of footwear. Prices of footwear have remained and will probably remain the same according to all indications. Rubber specialty producers are busy for the holiday trade, which is said to be larger than usual.

Industrial Prominence of Akron

Statistics prepared annually by the Chamber of Commerce show that the total capitalization of Akron's industries for 1922 is $390,004,638, and that the total industrial output amounted to $320,608,178. The following table shows the annual output of all factories, rubber production, number of employes and payroll of all industries for past years:

	Factory Output	Rubber Production	Payroll	Employes
1922	$320,608,178	$266,935,296	$75,642,750	49,708
1921	387,462,000	328,726,591	81,188,990	46,110
1920	640,923,232	544,729,000	145,147,110	74,850
1919	522,436,020	427,796,317	117,974,890	87,890
1918	411,119,861	332,085,090	74,500,000	61,991
1917	342,782,516	279,883,054	66,428,450	63,083
1916	226,668,556	188,740,000	40,622,000	57,322
1915	151,177,993	121,085,000	25,300,000	39,875

The prominence of Akron's rubber industry is shown by the following statistics for 1922, recently compiled by the Chamber of Commerce: Capitalization, $345,834,039; total rubber production, $266,935,296; annual payroll, $64,176,299; and number of employes, 41,000.

Akron Labor Situation

The labor situation in Akron has improved greatly during the last two years and is considered highly satisfactory with no particular problems being faced. Most of the 40,000 men who left Akron when the depression came were single men. Those kept were the efficient workers with families and homes. As a result the personnel of the Akron rubber forces is of a high standard, consisting of over 75 per cent picked men highly trained for their work. As new men are needed, as seems certain now, the industry has a large reserve of rubber workers to draw from.

Wages, while considerably below the peak period, are still above the average of the country. The rubber industry, with the possible exception of the automobile industry, is still considered the best paying, and for that reason does not face the labor difficulties common to other lines of manufacture. During the past year average wages advanced not over 7 per cent, but have been satisfactory to the men.

Training Rubber Executives

Training executives for important positions in the rubber industry has become a problem, and the plans adopted to produce them in the large plants are varied. The most recent one is closer cooperation between the Municipal University of Akron and the rubber industry to train men in the industry as rapidly as they are educated in university subjects.

The inability of the average college graduate to apply his collegiate work to the production of net results for the company with which he becomes identified after graduation has been long taken for granted. While the University rubber course is one of the few in the country, it still does not altogether meet the needs of the industry. For that reason a plan has been worked out whereby the students do college and practical work in the rubber factories at the same time. The idea is that followed in many night schools and other institutions where the students alternate jobs. More than 160 students are working on this shift basis, the majority in some of the larger rubber factories in the city.

Crude Rubber and Tire Prices

Because rubber goods manufacturers here refused to believe that the schemes for restriction of crude rubber production could be made workable, the adoption of the Stevenson plan swept the industry off its feet, to all appearances. The amount of crude rubber which manufacturers have on hand cannot be definitely ascertained, but the manner in which the adoption of the Stevenson plan was received indicates to crude rubber brokers that supplies are not very great.

The first obvious result of advancing rubber prices would be an increase in tire prices. When crude rubber had risen 11 cents above the year's low it was expected that the Mason Tire & Rubber Co. price increase of 5 per cent November 15 would be generally followed.

Much to the surprise of the trade the larger companies have announced no advances and it is now believed that none will be made until the first of the year at least, if then, although a complete change of the situation almost over night would not be entirely unexpected.

That some of the larger companies were caught with small supplies of crude rubber seems certain, but that they can easily meet increased tire costs by raising tire prices, which are now 20 per cent below pre-war prices and more than 45 per cent below peak war prices, is admitted by all the manufacturers.

If the restrictions result only in fair prices and fair returns to the growers Akron manufacturers will not object, but what is now feared is that the machinery set up to restrict production will result in prices which are not justified by production costs. It is to offset this contingency that the manufacturers have joined The Rubber Association of America in an effort to come to a better understanding of the entire situation through meetings with representatives of the producers.

The increased crude prices thus far have added approximately 50 cents to the cost of an average small tire and of larger sizes.

Because the margin of tire profit has been reduced materially during recent months by the increasing cost not only of rubber but of fabric and other raw materials, while the prices of the finished goods have remained the same, many of the smaller manufacturers are worried over the situation.

Mason Increases Tire Prices

The Mason Tire & Rubber Co. during the past month increased its prices an average of 5 per cent throughout its lines. It was at first believed that the move indicated the beginning of a general tire price increase which has been generally predicted, but analysis showed that the Mason company was in reality only bringing its prices more closely to the general prevailing lists. The company was one of the first to cut and continued to cut during the year with the hope of reaching a fair price level at which tires could be made and sold. The last cut carried the company below standard lists and the increase brought prices back in line with other makes. The company has increased production until output is now nearly 5,000 tires a day.

Akron

Active work has been started on the construction of the new additions to the plant of the General Tire & Rubber Co., Akron, which will double the capacity of the factory. The contracts provide that the new plant shall be completed and ready for operation before the end of the present year.

R. H. Jeffers

R. H. Jeffers, for many years connected with the Firestone Tire & Rubber Co., at Akron, has been named vice-president and general manager of the Canadian subsidiary of the Firestone company at Hamilton, Ontario. The new plant has been in operation for several months and production is increasing as the distribution system in Canada and foreign countries is enlarged.

The P. E. Welton Engineering Co., 46 South Broadway, Akron, Ohio, has taken over the assets of the Akron Engineering Co., and will conduct the same line of work. The board of directors includes the following: P. E. Welton, president and general manager; G. W. Wadsworth, vice-president; J. W. Tyrrell, secretary and treasurer; E. R. Bond, tire superintendent; W. S. Lockert, C. D. Crumb, Sidney Conners, and A. S. Mottinger, attorney. The company operates as civil, architectural, electrical, mechanical and chemical engineers, specializing in rubber plant service.

The Western Rubber Mold Co., Akron, announces that business is satisfactory and further increases in production may be expected within the next few months. F. H. Vermiliion, founder of the Miller Repair School, joined this company in September as vice-president and sales manager. In the last number of THE INDIA RUBBER WORLD it was incorrectly reported that he had joined the Western Reserve Rubber Co.

The New Haven Sherardizing Co., specializing in seamless mandrels for the manufacture of inner tubes, with main offices and factory at 868 Windsor street, Hartford, Connecticut, has recently leased a factory at 917 Switzer avenue, Akron, Ohio. The new plant, which will be in operation by January 1, is located in the heart of the rubber district, and is well suited for the purpose for which it is leased. The establishment of this factory

in Akron will prove an economic measure as more than 60 per cent of the company's equipment is supplied to this particular district.

N. A. Gibbons, for the last ten years connected with the fabric department of The Goodyear Tire & Rubber Co., and during the war one of the inspectors of fabric for the Government, has resigned to become the Akron representative of Forney & Co., of New York, N. Y.

F. E. Titus, for several years sales director of the International B. F. Goodrich Co., has been named second vice-president of this company, and is now on a trip abroad. A. G. Underwood has been promoted to sales manager of Goodrich bicycle and motorcycle tires and automobile rubber sundries.

The Swinehart Tire & Rubber Co., Akron, has added a number of men to its tire department, due to increasing demand for automobile truck tires. The plant is now operating at better than 80 per cent of normal. The company during the year added a few minor rubber products to its list, including door mats and rubber tires for coaster wagons.

The Miller Rubber Co., Akron, is building the first unit of a plant for the manufacture of rubber gloves and other dipped goods of the highest class only. The Miller Rubber Co., it will be remembered, originally entered the rubber field as a producer of rubber gloves and dipped goods, but several years ago sold its business to a Cleveland concern and agreed to remain out of this field for a definite period. This period expired more than a year ago and now the company is going back into its first business.

The company is producing all the tires it can make in its present plant, its sundry business is the best in its history, and the novelty business which was entered a year and one-half ago is showing constant growth.

The business of The India Tire & Rubber Co., Akron, for the year ending December 31, will show an increase of more than $800,000 over last year's business, which amounted to slightly over $1,200,000. During the past month the company placed on the market a new high quality tire which will sell as follows: 30 by 3½, $16.95; 32 by 4, $30.60 and 35 by 5, $51.50. The 35 by 5 contains two and one-half pounds more rubber in the tread than the standard tire besides other construction improvements. The company's export business has increased to almost 10 per cent of its total volume. Efforts to obtain export business were not started in earnest until about a year ago.

The Interlocking Cord Tire Co., Akron, reports that more than 25 per cent of the $175,000 first mortgage bonds which were offered for sale a month ago to provide funds for increased production has been sold. The resignation of C. A. Rukamp as secretary of the company has been announced. Mr. Rukamp came into the company at the time of the reorganization more than a year and one-half ago, following the receivership.

The Goodyear Tire & Rubbber Co., Akron, has postponed the production increase scheduled for November 1 until December 1, although all its working forces are being held together in anticipation of the upward movement at that time. The present output is approximately 21,000 tires a day.

The report of the Goodyear system for utilizing suggestions from factory workers for increasing efficiency and improving working conditions, covering more than ten years of this practice, shows a total of 54,881 suggestions, of which 5,189 awards amounting to $17,802 have been paid to the authors. The average award is now between $10 and $15. A janitor at the Goodyear plant, has received more than $600 for suggestions, and a number of other men have received several hundred dollars each. E. G. Dern has been in charge of the suggestion department for the past five years.

Ohio Notes

The Ideal Rubber Co., of which S. N. Paradise, formerly of Akron, is president, has started operations at Kent, Ohio. The company will make rubber aprons and other rubber household specialties.

H. L. Beaty has been named receiver of the Cascade Rubber Co., Ravenna, Ohio. The assets of the company as reported to the referee in bankruptcy, Harry L. Snyder, of Akron, are $20,000 and the liabilities $25,000.

To enable The Hubbell Rubber Co., Cleveland, Ohio, to protect its stockholders better and operate its plant, a friendly receivership has been instituted. B. M. Gardner, formerly its treasurer, has been appointed receiver. The company's office in Seventy-First Euclid Building has been closed and the temporary office is at 304 National Building, East 9th street, Cleveland, where all correspondence should be directed, marked personal for Charles C. Hubbell.

The India Tire & Rubber Co., Mogadore, Ohio, is now running its plant with night and day shifts, while the daily production amounts to 600 tires and 1,000 tubes. D. A. Grubb is secretary and sales manager.

Operations on a night and day schedule are being carried forward at the plant of The Hermann Manufacturing Co., St. Marys, Ohio, in an attempt to fill the orders of The Hermann Tire Building Machine Co., of which it is a subsidiary. Organized last summer for the purpose of making all kinds of special machinery, The Hermann Manufacturing Co. is finding itself taxed to meet the increasing demands for tire building machines alone. W. H. Hermann is general manager.

At the plant of the Republic Rubber Co., Youngstown, Ohio, the production of both mechanical goods and tires is steadily increasing, while the volume of business for this year, officials state, will certainly reach $7,000,000. Although in the hands of a receiver, this company finds a growing demand for its manufactures and in consequence the present daily output of 300 tires will soon be raised to 1,000. Old bills are being paid, while the increasing production now planned promises to result in satisfactory net earnings. E. H. Fitch is general manager.

Several of the rubber machinery manufacturers of Ohio report improved business conditions, and an encouraging outlook for the future. From the "Rubber City" comes word that The Akron Equipment Co. is finding affairs in better shape than a year ago; The Akron Standard Mold Co. has recently increased its floor space by 50 per cent, while the volume of orders for new work is exceeding the company's expectations; and The Akron Rubber Mold & Machine Co. is planning new equipment, and claims that prospects look very bright for the balance of this year.

The Vaughn Machinery Co., of Cuyahoga Falls, Ohio, has also been installing a considerable amount of new machinery, and reports much more work on hand than usual.

The Rubber Trade in the Midwest

Manufactured Goods

Rubber factories in the Midwest are well occupied in meeting the general demand for tires, tubes, and mechanical goods of all kinds. The usual seasonal decline is thus being markedly moderated. Difficulties incident to carload movement of supplies and finished product are continuing in less degree with the approach of the fuel situation to normal.

Midwest Rubber Manufacturers' Association

On November 14, the Midwest Rubber Manufacturers' Association held one of its most interesting and well-attended regular monthly meetings of the year at the Missouri Athletic Club, St. Louis, Missouri.

This was a special luncheon meeting arranged by the following committee: F. W. Knoke, American Zinc, Lead & Smelting Co., chairman; Mr. Snead, Southern Acid & Sulphur Co.; Edward Gereke, Gereke-Allen Carton Co.; Mr. Budd, Bibb Manu-

facturing Co.; W. L. Burgess, Burkoe Tire & Rubber Co., and Horace Ramsey, The Cupples Co.

Following an interesting address, timely topics of rubber manufacturing interest were discussed. Details of the program, however, did not come to hand in season to be included in this reference.

Midwestern Notes

A recently organized concern, with offices at 531 South Peoria street, Chicago, Illinois, is that of Callahan & Co., importers and manufacturers of colors, chemicals, and fillers for the rubber trade. Among the commodities imported directly by this firm are Italian sienna, Turkey umber, red oxide, and Vandyke brown, as well as other paints, colors and pigments. Callahan & Co. are not only the exclusive representatives of several American manufacturers, but they are also agents for various European concerns.

The Cable Sales Co., 315 East Main street, Kalamazoo, Michigan, was originally organized in 1921 for the purpose of wholesaling tires and tubes on a large scale. The incorporators were J. H. Cable, C. V. Cable, and C. W. Taylor, all formerly connected with The B. F. Goodrich Co. The last two have since retired, while D. L. Cable has become a member of the company. Recently activities have been extended to include handling all kinds of manufactured rubber goods. The concern is particularly interested in rubber specialties and novelties.

Suit is being brought by the local district court against subscribers to the capital stock of the Wilson Rubber Co., Des Moines, Iowa. It is stated by Walter Mauthe, receiver for the Wilson company, that the action is in the nature of a creditors' bill, and has been taken against those subscribers who have failed to pay their subscription contracts in full, the creditors claiming the right to enforce collection thereof for their benefit.

John D. Cary, who has recently been appointed sales manager of the International Rubber Company of America, Anderson, Indiana, has had a wide experience in the tire industry. In 1900, he became connected with Morgan & Wright, following this with ten years' service for The B. F. Goodrich Co. and subsequently joining the forces of the Kelly-Springfield Tire Co.

It is reported that by April 1, 1923, the International's present daily production of 600 tires will increase to 1,000, while plans are also being made to manufacture 2,000 tubes daily. H. W. Lantz is factory manager, and J. D. Wiggins general manager.

A quarterly profit bonus dividend amounting to 15 per cent of their respective salaries and said to be the largest bonus ever paid by any rubber company, was handed to employes of the Gates Rubber Co., Denver, Colorado, on November 1. The dividend is based on the company's net earnings, and the workers will also receive at the end of the next quarter a certain amount in excess of the 15 per cent, which will be paid to them with that quarter's earnings. In the past year over $100,000 has been paid in dividends to Gates employes under the bonus dividend plan.

The Rubber Trade on the Pacific Coast

Manufactured Goods

The lively upturn in the automobile trade has had a particularly stimulating effect on the tire and tube industry on the Pacific Coast, and, almost without exception, manufacturers and dealers report a smarter demand than usual at this time of year for tubes and casings. With the cessation of price cutting, which troubled the trade greatly a few months ago and which occasioned no little resentment among many overstocked dealers, has come a better feeling. Dealers in repair materials also remark an improving demand for their goods. Due to generally favorable weather conditions, building operations hold up well throughout the Coast region, and mechanical rubbers are finding ready sale. Druggists' sundries, belting, hose, packing, and molded goods are in good demand. Retailers, particularly in the northern section, report rubber shoe and boot stocks moving well. Money is easy and collections reported good.

Lee Organization Opens New Branches

By opening in the Far West, and particularly on the Pacific Coast, several new branches under direct factory management, The Lee Tire & Rubber Co., Conshohocken, Pennsylvania, adopts a system which it is believed will prove even more successful than the method previously in use. Harry E. Field, vice-president and general sales manager, states that on and after January 1, 1923, several Lee branches will be opened in the larger coast cities, which will be under the immediate jurisdiction of the parent organization.

Los Angeles

What is said to be the largest order for automobile fan belts ever placed by a Pacific Coast purchaser was recently executed by the Farran-Kinney Co., 327 South La Salle street, Chicago, for the Chanslor-Lyon Co., automobile supply dealers, 1200 South Grand avenue, Los Angeles, with branches in San Francisco, Spokane, Seattle, Tacoma, Portland, Fresno, and Oakland. The order was for 800,000 belts, a large portion being the rubber-friction multiple-tape type, the remainder being the new Sea Island cord molded V-cushion rubber type. The shipment made nine carloads, and the distribution is said to have been made in record time.

The November average production at the California Goodyear plant in Los Angeles was a little over 3,600 tires and 3,800 tubes a day, as compared with the peak record of 4,400 tires early in August. The output, it is stated, will begin to increase steadily from this time onward to meet the rising tide of orders from dealers who will take advantage of the spring dating. In 1922 this arrangement permitted dealers to defer payment to May 1 on any orders placed during the four months ended on that date, and the same advantage will be given dealers again during the four months ending May 1, 1923. The plant is working full time with its regular complement of operatives, and the only trouble experienced is said to be in getting plenty of the right kind of help. The financial status of the Goodyear tire concern is improving very much, and it is believed that the deficit will be quite cleared up and dividends probably resumed on the preferred stock within a year.

P. W. Litchfield, vice-president and factory manager of the parent Goodyear company, accompanied by B. Darrow, in charge of the technical department of the Akron plant, have been spending several weeks studying cotton conditions in Arizona and at the Los Angeles Goodyear tire and textile works. The textile company is doing especially well, and is paying 7 per cent dividends regularly on its preferred stock.

A. F. Osterloh

A. F. Osterloh, vice-president and general manager of the Los Angeles Goodyear plant, recently returned from a 5,000-mile trip covering the company's branches in the Pacific Coast States. A surprise awaited him in the form of a gold service pin awarded for his twenty years of active service as a Goodyearite. Starting as a general line salesman October 22, 1902, at the Chicago branch, he became successively branch and district manager, western sales manager, assistant secretary of the company in Akron, then secretary, and finally was promoted to his present position, which he has filled to the satisfaction of the company. He has meanwhile endeared himself to his associates and employes, as well as been a forceful leader in many southwestern civic activities. A. F. Osterloh, Jr., is one of the Goodyear salesmen.

An industry which interests coast rubber manufacturers is the mining of talc from an immense deposit on the rim of Death Valley, California, by a Los Angeles concern, the American Talc Co., of which W. H. Kennedy is president. The product is said to be 99 per cent pure.

The Samson Tire & Rubber Company, Los Angeles, of which Adolf Schleicher is president, is working its enlarged plant at Compton, California, to capacity. Demand for cord tires is especially good and the company has been fortunate in getting a good corps of "cord" builders. The big selling agency, Guasti, House & Giulii, Inc., recently announced that it would feature Samson products in southern California.

Frank D. Voorhees, of the Voorhees Rubber Manufacturing Company, Jersey City, New Jersey, has recently been making a personal study of trade conditions on the Coast.

San Francisco

The Firestone Tire & Rubber Company, San Francisco branch, reports a marked improvement in sales since moving from automobile row on Van Ness avenue, where it was for ten years, to its larger quarters in a four-story concrete building on Townsend street. Following the general trend in the rubber line on the coast, the Firestone concern quit retailing completely and is now distributing by wholesale to all points on the Coast and in the Orient. At the new place the branch has a great deal more storage space and a spur of railroad track. F. L. Flickenger is manager.

The Coast Tire & Rubber Company is operating its new plant in Oakland night and day in an effort to fill a large inrush of orders from all points on the Coast. Minimum production is 400 tires a day, chiefly cords. In sixty days a 200 per cent increase in orders has been noted by John A. Pankratz, vice-president.

A decided increase in sales units and gross value is reported by the San Francisco branch of the United States Rubber Company, in comparing November, 1922, business with that of 1921. The sales are well distributed among the company's numerous products. While tires lead, they are closely followed by a wide range of mechanicals. The sales force has lately been strengthened considerably in numbers and personnel.

Secretary M. H. Gregg, of the Sturges Tire & Rubber Company, Oakland, reports that his company, which is now specializing on tires, finds business steadily improving. Efforts are continually being made to improve the quality and design of the casings. The latter are made in all the standard sizes and are sold direct to consumers.

A steady and growing trade in belting, hose, printers' rolls, and various rubber specialties is reported by the Universal Tire & Rubber Company, 938-958 Harrison street, San Francisco, of which George M. Stevens is president and John V. Filippini is secretary-treasurer.

Inner sole tires, puncture proof tubes, beadless tires, and various mechanicals and automobile accessories are being turned out on an increasing scale at the plant of the National Consolidated Rubber Co., Second and Howard streets, San Francisco. W. H. Booth is president and general manager and George A. LeDoux, of Los Angeles, secretary-treasurer.

T. H. Wilkinson, for many years manager of The United States Rubber Co.'s branch, and one of the best known rubber men on the Coast, will be in charge of the San Francisco offices of The Lee Tire & Rubber Co.

The Northwest

The Northwestern Rubber Company, Kent, Washington, is very busy making inner tubes, and has lately appointed many new exclusive agents. The company uses the plant of the former Wicks Tire & Rubber Company, has added much to the equipment, and will soon install apparatus for making tires.

The Columbia Tire Corporation, Portland, Oregon, reports business as in a very encouraging condition, the demand being particularly good for C-T-C cords. A steady addition is being made to the list of dealer agencies.

The Seattle branch of the Lee Tire & Rubber Co., which includes a service station, will occupy its own building at Ninth avenue and Olive street, and will be in charge of C. C. Miller, formerly manager of the Goodyear branches in Seattle, Spokane, and Butte. The branch at Broadway and Flanders street, Portland, Oregon, will be under the management of D. L. MacPhee, formerly with The United States Rubber Co. The Lee interests in Spokane will be represented by G. B. Kemp and R. S. McClintock of the Inland Battery Co., 1215 Riverside avenue, West, while in Butte, Montana, P. E. Crawley will assume the distribution of Lee tires in eight counties.

The Southwest

Raymond V. Morris, vice-president and general manager of The Spreckles "Savage" Tire Company, San Diego, reports an excellent condition of trade at the Savage works. As a result of a recent strenuous advertising campaign, using artistic posters and newspaper advertisements, in the entire territory west of Denver the plant has had an influx of orders for "cords" that is taxing its mechanical resources. Mr. Morris has lately invested in the Cadillac agency for San Diego.

Canada

To Associate Name with Products

In order that the name of the company may appear, as well as to obtain greater uniformity in the branding of its products, Gutta Percha & Rubber, Limited, Toronto, Ontario, has adopted a new design consisting of the initials "GP" within a circular arrangement of the company name, all inside of a circle with the bottom extended to accommodate the word "Limited." This design has been used for some time on tires and it will be applied to footwear and other lines as soon as the necessary changes can be made. The word "Outing" will continue to be used as a descriptive name in connection with the company's canvas rubber-soled shoes.

Gutta Percha & Rubber Co., Limited, contributed $1,000 to the recent drive conducted by the Federation of Community Service, Toronto.

Reorganization of Ames-Holden-McCready, Limited

As the result of the recent and final plans for the reorganization of Ames-Holden-McCready, Limited, that company has begun operations with new cash capital amounting to approximately $1,000,000, while at the same time arrangements have been made for the release of the company from its guaranty of the Ames-Holden Tire Co. bonds and the release of the common stock holding in the tire organization by the parent company. Creditors who preferred to have their claims paid in cash have received forty cents on the dollar, while others were reimbursed in preferred stock of the reorganized company.

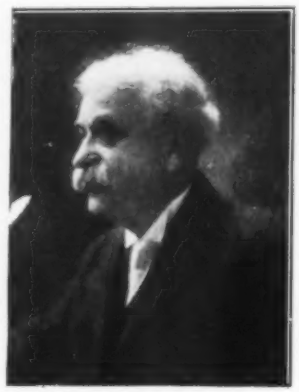
Ames-Holden Felt Co., Limited, producing felt footwear and all kinds of felt for industrial purposes, has been merged with the new company which makes every conceivable kind of footwear worn by the Canadian public. Ames-Holden Tire Co., Limited, however, will remain as a separate organization, but will continue to manufacture automobile tires and accessories as before.

According to statements by the company's officials, the volume of sales for the ten months ended October 31 compares very favorably with that of the previous year, the increase in sales of rubber products being approximately 50 per cent. There is a very satisfactory outlook for the present and future business of this well-known organization which for seventy years has held a place of importance in Canadian industry.

The Obituary Record

President of Well Known Brooklyn Organization

CHARLES J. TAGLIABUE, president of the C. J. Tagliabue Manufacturing Co., 18-88 Thirty-third street, Brooklyn, New York, died on November 2, at the age of seventy years. As head of a concern which began operations in 1874, Mr. Tagliabue has continued the manufacture of thermometers and temperature recording instruments, largely used in the rubber industry, a business which has been carried forward by the Tagliabue family without interruption since the year 1769. From its organization in a small building at 298 Pearl street, New York, the business has grown to its present size under the capable leadership of its founder. Mr. Tagliabue was a member of the Brooklyn Chamber of Commerce, the Rotary Club, and various other business and civic associations.



Charles J. Tagliabue

Prominent Textile Machinery Manufacturer

James Butterworth, retired president of H. W. Butterworth & Sons Co., textile finishing machinery manufacturer, Philadelphia, Pennsylvania, died November 14, in his 83rd year.

Mr. Butterworth was president of the Butterworth organization from 1889 until 1905. Born in 1840 in Philadelphia, son of Henry W. Butterworth, in turn son of John Butterworth, who founded the company in 1820, he attended public school and afterwards graduated from Central High School, Philadelphia.

James Butterworth

Following his formal education, Mr. Butterworth entered the then well established H. W. Butterworth organization, the firm name being changed afterwards to H. W. Butterworth & Son. This was again changed to "and Sons" when James Butterworth's two brothers, Charles C. and William B. Butterworth, were admitted into the firm in 1873.

The business under James Butterworth's able guidance continued to grow. In 1889 the company was incorporated and the firm name became "H. W. Butterworth & Sons Co." When James Butterworth retired in 1905, his son, Harry W. Butterworth, succeeded him in the presidency of the company. Albert Butterworth and J. Warner Butterworth, his second and third sons, are vice-presidents.

Mr. Butterworth was a member, and in 1889 a vice-president, of the Union League, Philadelphia. He was also trustee of the Penn Mutual Life Insurance Co., a director of the Fire Association of Philadelphia, and a former member of the Manufacturers' Club, Philadelphia. He was the oldest member of the Second Baptist Church of Philadelphia, being connected there for 66 years. Interment was made in Laurel Hill Cemetery.

Well Known in New England

The Honorable John N. Cole, Andover, Massachusetts, who passed away last month, was well known to the New England rubber trade, and was a boyhood friend of the Editor of this journal. He was Speaker of the Massachusetts House of Representatives, Chairman of the Boston Industrial Development Board, and a power in Bay State politics. A gifted editor, brilliant debater, successful organizer, his passing brings grief to a wide circle of friends.

American Rubber Industry in 1919

In 1920 the United States imported unmanufactured rubber, valued at $248,900,217, while it exported in the same year rubber and manufactures of rubber valued at $85,436,897. In 1919, there were 495 plants in the United States manufacturing rubber goods, divided as follows: Eastern States, 216; New England States, 144; and Midwestern States, 135. The total production for that year was estimated at $1,088,603,144; the capital involved represented $882,021,484; while the number of wage earners totaled 146,643. Naturally, in comparison with the other States, Ohio leads, while Iowa has the lowest figures for capital, wage earners, and production.

The following tabulation was prepared from figures supplied by The First National Bank of Boston, Boston, Massachusetts.

	Plants	Capital	Wage earners	Production
Connecticut (1919)				
Boots and shoes (rubber)	5	$29,235,801	6,439	$22,451,000
Rubber goods	21	35,224,104	5,060	33,928,000
Suspenders, garters, and elastic woven goods	15	15,787,934	3,426	16,966,000
Indiana (1919)				
Rubber goods	15	$25,182,334	2,917	$20,883,668
Iowa (1919)				
Rubber goods	9	$9,928,488	839	$6,333,000
Massachusetts (1919)				
Belting and hose	3	$17,654,898	2,441	$13,859,748
Boots and shoes	8	43,582,806	13,062	44,307,961
Rubber goods	47	64,948,481	9,406	93,376,505
Suspenders, garters, and elastic woven goods	29	10,155,302	2,965	14,971,600
Michigan (1919)				
Rubber goods	7	$57,418,022	5,044	$50,318,116
New Jersey (1919)				
Rubber goods	65	$57,638,272	12,353	$84,129,058
New York (1919)				
Rubber goods	40	$28,043,157	5,370	$33,033,000
Suspenders and elastic goods	80	3,888,832	1,238	10,618,000
Ohio (1919)				
Rubber goods	96	$398,125,426	63,637	$551,118,488
Pennsylvania (1919)				
Rubber goods	31	$37,690,301	4,880	$35,792,000
Rhode Island (1919)				
Rubber goods	6	$20,076,684	2,117	$15,887,000
Suspenders, garters, and elastic woven goods	10	2,428,101	892	4,261,000
Wisconsin (1919)				
Rubber goods	8	$25,011,541	4,557	$36,369,000

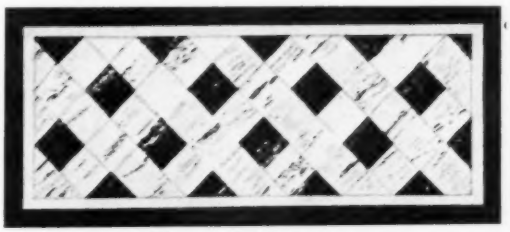
GERMAN RUBBER IMPORTS FROM BRITISH MALAYA

Rubber represents one of Germany's chief imports from British Malaya, and the total purchases of this commodity by the former country have risen from £123,900 in 1920 to £174,650 in 1921, while corresponding figures for imports of gutta percha are £2,680 in 1920 and £9,560 in 1921.

Cotton Fiber and Rubber Flooring

JUST as the rubber fiber sole proved of more worth than the all rubber article so rubber fiber flooring challenges the matting made wholly of rubber. By test its abrasion resistance approaches that of marble. It is not marred by ordinary foot traffic, grit tracked in from the street, shoe nails, or wheel castors. It does not indent under standing or moving furniture. Its uniformity of wear is a vital factor, as is its secure bond to the foundation floor.

Vulcanized under great pressure, it has a surface slightly glazed and non-absorbing, and it generates no dust and has no odor.



Stedman Naturized Flooring

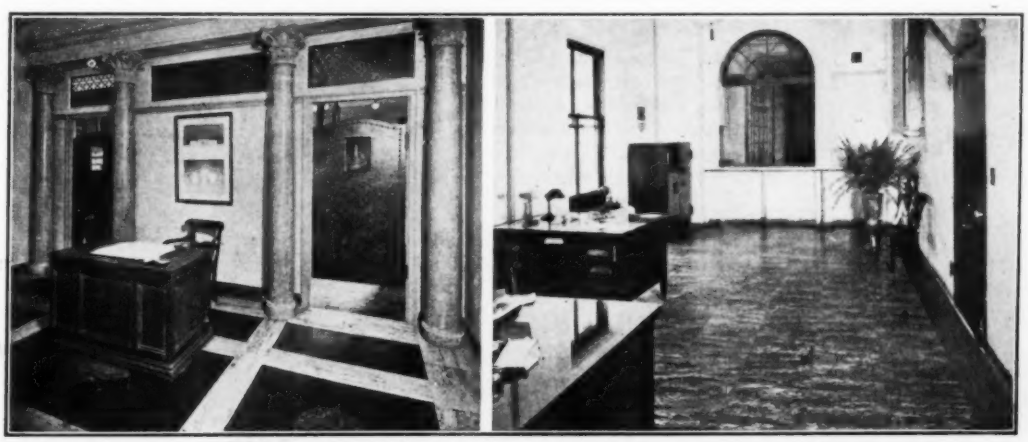
Hospital floors, as a rule, are subjected to more severe usage than the floors of offices, stores and many places that might be classed as industrial. Moreover, hospital floors must meet numerous rigid requirements which are not factors in ordinary commercial usage. Silence, comfort, sanitation, continuous availability, refined beauty, resistance to fire, staining, acids and alkalis are essential.

In the report of the committee on floors, which was submitted at the annual conference of the American Hospital Association, Atlantic City, New Jersey, September 25 to 30, reinforced rubber flooring was the soft-type covering recommended as first choice for nine out of the twelve classes of rooms into which hospitals are divided, there being no recommendation in the other three classes. This compares well with the most favored hard-type flooring, terrazzo in blocks, which was recommended for only six classes of rooms, there being other hard-type recommendations for the remaining six classes of rooms. Reinforced rubber flooring was recommended for private rooms, wards, corridors, laboratories, operating rooms, out-patient treatment rooms, out-patient corridors, office and service rooms, the latter class including utility, service kitchens, toilets and baths.

Of the fifty-six different samples of floor coverings, both hard and soft types, which were submitted to laboratory tests to determine the relative resistance to abrasion, pressure, fire, absorbency, staining, acids and alkalis, the reinforced rubber flooring known as Stedman Naturized Flooring received a rating which was the highest awarded for all characteristics except acid and alkali resistance, which was indicated as B and specified as good at 80 to 89 per cent. This was an especially severe test, the samples being submitted to applications of concentrated nitric, sulphuric, hydrochloric, oxalic and acetic acids, no attempt being made to remove the solutions applied. Reinforced rubber was recommended as the best soft-type floor covering in laboratories, where acids are chiefly used in hospitals. The results of these tests form an illuminating permanent exhibit at the headquarters of the American Hospital Association in Chicago, Illinois.

Other factors contributory were actual service tests resulting from many installations in leading hospitals and other buildings, public and private, of which the new Fifth Avenue Hospital, New York, N. Y., and the Mt. Sinai Hospital, Cleveland, Ohio, are perhaps the most notable examples. Not only does this forecast the extensive use of reinforced rubber flooring in hospitals, but in many other public and commercial buildings where the requirements are less rigid.

The Stedman Naturized Flooring is a compound of rubber and cotton fiber, vulcanized under great hydraulic pressure. It is made in runners 16 feet by 40 inches and in border strips of various widths, both ⅛ to ¼-inch thick, and in square and rectangular tiles, large and small, 3/16 to ½-inch thick. Wainscoting and wall paneling are also available from 1/16 to ¼-inch thick; likewise molded sanitary bases and decorative units, stair treads, drain mats, table, desk and counter tops.



Typical Applications of Naturized Flooring

All the above types may be had in solid colors and tones, also in a great variety of veined, mottled and blended colors approximating marble, granite, tapestry and rug effects. For wall use interesting oatmeal and grasscloth effects are provided. The colors are permanent pigments and do not change from exposure or wear, as the variations run through the entire thickness of the material. Moreover, these blended color types neutralize the effects of heavy foot traffic.

This rubber flooring is laid over any smooth, level and dry surface of wood or concrete to which it is adhered by a waterproof cement, making it part of the foundation floor.

The Rubber Industry in Great Britain

By Our Regular Correspondent

The Stevenson Restriction Plan

THE report of the Stevenson Committee of the Colonial Office is now common knowledge. It cannot be said that the idea of an export duty on the excess production over a certain amount has received general commendation, there being plenty of expressed opinion that things had better be left to take their own course, especially as the price was improving. This view evidently, and perhaps naturally, has the support of the India Rubber Manufacturers' Association, whose letter to the committee formed a mild sensation just prior to the publication of the report. The lateness of the protest caused some comment and it would certainly seem that it might have been made earlier.

As it is most unusual for the views and interests of buyers and sellers of any commodity to coincide, this protest is only what might have been expected. The non-success is due to the feeling of the committee that no consumers of raw materials ought to receive such at a price below the cost of production, and in this case it is a sound proposition that to insure future supplies being forthcoming the rubber must be produced at a profit. This does not mean that boom prices are justified, and it is to be hoped that the days of huge dividends are over.

Whether the cause is the report or the rise of *3d.* per pound in the price, a boom has arisen in the plantation share market quite unexpectedly, though there does not really seem to be much justification for it. Among substantial rises may be mentioned Lungei Buaya from *7s. 6d.* to *20s. 6d.*; Djember from *16s.* to *28s.*, and Rubber Trust from *13s. 9d.* to *21s. 3d.*

Mechanical Trade Awaiting Better Times

Our mechanical rubber trade, though by no means stagnant, still awaits better times in the engineering and other industries which consume its products, the market being mainly a home one. Those firms which make from hand to mouth have been more adversely affected by the slackness in general demand than the bigger concerns which keep substantial stocks of a variety of goods.

Institution of Rubber Industry

At the Manchester meeting in October, D. F. L. Zorn read a paper entitled "Symbolic Rubber." The subject matter was mostly mental philosophy, or metaphysics, or whatever is the correct term to apply to a discourse on mind and matter. Foreseeing that there might be some hesitancy on the part of those whose acquaintance with rubber heels and bathing caps was more profound than their familiarity with metaphysics, the lecturer somewhat astutely asked for information on half a dozen trade matters which he did not understand himself. The ensuing discussion hinged to a much greater extent on these points than on the main subject matter of the paper. With regard to the paper generally, the symbolic rubber was presumably to rub out false impressions of mind and matter.

One of the queries Mr. Zorn put out was whether any profiteering exists between the rubber trade and the shop counter, because it seems as if too much is charged for rubber goods generally. Those who replied to this showed pretty conclusively that there is nothing but fair business profits in all sections of the trade. With regard to another query as to why British manufacturers cannot turn out colored rubber goods equal to the American products, the speaker seemed to think that there is very little difference in appearance and that even if the appearance of the American goods is better they have other defects from which the British are free. It was conceded, however, that in some cases the Americans take more trouble: in regard to bathing caps the British have a sort of standard helmet, while the Americans send fashion experts about to get the latest ideas as to form and color. The hot-water bottle came up again for discussion and more evidence was forthcoming to the effect that although superior in appearance and rather lower in price, the American product does not last as long as the British.

In connection with this discussion Fordyce Jones referred to the unburstable ball business which is a large one in America. Both in balls and sponges the Americans, he said, are getting the business because all little details are well attended to and the finish and packing are superior. More than one speaker testified to the inferiority of American proofings.

In his reply Mr. Zorn referred to his pet scheme of a rubber parliament, mentioning that the Rubber Growers' Association Propaganda Committee has invited four members of the Institution to sit with them.

Annual Meeting

At the annual general meeting held in London in October the president, Alexander Johnston, of the North British Rubber Co., Limited, referred to his conversion to an appreciation of the objects and work of the Institution, which he did not join at the outset from a feeling that there was little room for it, and went on to regret that many prominent manufacturers did not yet see their way to follow in his steps. He described the year book which had just been issued to the members as marking a forward movement which could only be described as epoch making.

Alfieri Picture Service

First Annual Dinner of the Institution of Rubber Industry at the Hotel Victoria, London

The accounts having been passed, Mr. Johnston was reelected president and the election of the new council followed. Vice-presidents elected were: Lord Colwyn, Sir Frank Swettenham, D. F. L. Zorn, Howard Figgis, George Beldam, H. W. Hatton and H. G. Montgomery.

First Annual Dinner

In the evening following the meeting more than a hundred members and guests, including a number of ladies, attended the first annual dinner, the president, Alexander Johnston, presiding. In proposing "The Institution of Rubber Industry" as the first toast, Mr. Johnston claimed that, due to the efforts of many of the members, the organization has already made good, and that its constant aim in the future will be to promote a better understanding and a closer relationship between all sides of the india rubber industry. To this Herbert Rogers replied in a few well-chosen words.

Other toasts followed, including "The President," by Hugo W. Hatton; and "The Vice-Presidents," by Fordyce Jones. In responding to these, D. F. L. Zorn humorously set forth some of the objects of the Institution, prophesying, however, for it a vigorous and useful future. The toast "The Industry" was then proposed by J. H. C. Brooking, to which J. H. Mandleberg replied, while Sir Frank Swettenham responded to "Allied Institutions," proposed by Herbert Standring.

The toast "The Ladies," proposed by Oswald Latham, was felicitously responded to by Mrs. J. Phillips Jones, while "The Visitors," by Ashley B. Cook, elicited a reply from J. A. Haworth, secretary of The India Rubber Manufacturers' Association. A tone of cheerfulness and optimism marked all the speeches made at this first anniversary meeting, which was a most auspicious occasion.

Arghan Fiber

A good deal is being heard in Lancashire about this new fiber, which is said to be capable of replacing cotton for many purposes, not the least important of which is fabric for motor tires. A. Montefiore, who is chairman of the Arghan Co., Limited, has recently seen the Manchester Chamber of Commerce and other textile authorities about the possibilites of the fiber, and among the facts which have come to light we are told that the natural habitat of the plant is being kept a secret and that plantations of it have been started in Malaya, where it is doing well. At present there are 60 acres of it and spinning results show 7,500 yards to the pound, though much finer counts can undoubtedly be spun.

It appears likely then that the fiber will be cultivated on a large scale and it is stated that arrangements have been made whereby rubber plantation companies will cooperate in the production of Arghan on a large scale, each company receiving sufficient young plants for 10 acres free.

A cotton spinner with whom the writer discussed the matter said there would seem to be a difficulty in the way of cotton mills taking up the new fiber because of its length of six feet. This would mean that new machinery would have to be installed. Incidentally, while on the subject of cotton, he remarked that he had just bought some of the new South African cotton at a somewhat lower price than he could have got American cotton for.

British Rubber Industry

Under this title a special section recently appeared in the Manchester *Guardian-Commercial*, published, it is stated, with the authority of The India Rubber Manufacturers' Association. Much interesting matter appears in it, though of more novelty and interest to those outside than within the trade. An interesting paragraph deals with new uses for rubber, in the course of which the suggestion is made that rubber latex having been used in paper making, it might also enter into the composition of cement. It is further suggested that it might replace asbestos as a covering for hot water cisterns. Various other possibilities are put forward, but of course suggestions are easy and cheap and perhaps it would be advisable to get to work experimenting.

Synthetic Camphor

A new synthetic camphor plant has just been completed at one of our large chemical works. When the natural camphor is forthcoming at a reasonable price this will probably be idle, but as our friends the Japanese have shown a tendency to starve our xylonite works for their own ends it is important to have a means of supply at home. The synthetic camphor is quite satisfactory in use.

New Companies

Duro Rubber Products, Limited, has been formed with a capital of £20,000 to use the Peachey process of cold cure in the manufacture of rubber soles and other rubber products. The company has taken over the Rowe White & Co. vulcanizing plant at Willesden in the neighborhood of the Peachey company's laboratory.

The Caddy Tyre Syndicate, Limited, with a nominal capital of £120,000, has been formed to manufacture pneumatic tires and various goods of rubber, gutta percha and asbestos, the registered office being at 11 and 12 Finsbury Square, London. The tire, claimed to be practically puncture proof, is of the armored type and owes its success to the elasticity of strips of helically coiled steel wire spring.

J. H. Smith & Co., Limited, is a new private company with a capital of £10,000 to manufacture and deal in waterproof and rainproof fabrics. The directors are J. H. Smith and I. L. Gotliffe, the latter having had a long connection with the manufacturing side. The registered office is at 100 Chapel street, Latford, Manchester.

Murray & Ramsey, Limited, is a private company with a capital of £20,000 formed to manufacture vulcanite and synthetic rubber, the registered office being at the Vulcanite Engineering Works, Carrington Field, Stockport

The Clayton Rubber Co., Limited, has been formed to take over the works lately occupied by United Rubber Products, Limited, now in course of liquidation. Sir William Veno is chairman and George Spencer managing director of the works, which are situated in East Manchester. It is understood that the principal activities of the company will be the manufacture of unburstable balls, rubber heels, floor coverng and certain mechanical goods.

BRITISH MANUFACTURERS PROTEST STEVENSON PLAN

British rubber manufacturers have expressed their disapproval of the recommendations of the Stevenson rubber control plan through the columns of the *Manchester Guardian Commercial*. Their committee concluded that it will be an all-around bad thing for the industry by benefiting Malayan estates at the expense of the Senegalese; place a premium on inefficiency in administration; prejudice the position of London as the raw rubber market in favor of New York and Amsterdam; and is ill considered from an international standpoint, fearing the possibility of retaliation on the part of America in the case of cotton since relative positions of the United Kingdom and America are reversed in relation to cotton and rubber supply.

In commenting on these views the Rubber Growers' Association considers them in the main as an attempt to anticipate the effects of the recommendations on the future of the rubber plantation industry. To the manufacturers' assertion that: "We, as manufacturers, do not wish to secure rubber at such a price as to cause future scarcity. Stabilization of price is the great consideration. Collaborative effort between manufacturers and planters is the only solution to a problem of this magnitude." the Rubber Growers' Association responds that the recommendations of the Stevenson plan and the work of the propaganda department of the association conform absolutely to this view.

"A continuation of the depression in the rubber plantation industry would be disastrous not only to the producing, but to the manufacturing branches of the industry. So long as it does not pay to produce rubber a very grave danger exists for those who use it.

"Producer and user alike will welcome a stabilized price. The price adopted by the Stevenson Committee's report is about one-half of that which rubber averaged during many years prior to the world slump of 1920, on which the manufacturing industry was built up with phenomenal rapidity."

The Rubber Trade in Europe

By Our Regular Correspondent

Germany

The *Gummi-Zeitung* generally has on its first page of text items headed, "*Das Wichtigste*" (The Most Important). It is significant that of late these are announcements of the price increases in the various branches of the rubber industry. Thus, one reads, surgical goods have again been advanced and the total increase on most seamless goods is now 4,200 per cent; on hard rubber goods, 2,500 per cent; on bathing caps, 1,800 per cent. Further on we find that 40 per cent has been added to tire casings and 50 per cent to tubes. In January of this year jar rings could be bought for 130 marks per kilo, although there were stocks left from the previous fall season at 80 to 90 marks a kilo. Now the price is 1,100 marks a kilo.

The exorbitant prices and shortage of money are having their effect. Orders are fewer and production is being cut down. Shortage of money and fuel and the high cost of raw material are responsible for this. At the Leipzig and Frankfort-on-the-Main fairs recently held, those firms that could give definite dates of delivery got orders. At Leipzig, hardly any business was done in technical rubber goods and pneumatic tires.

A little while ago it was suggested that manufacturers should make their local customers also pay in foreign currency. Now it appears that a number of manufacturers' associations actually intend to carry out this suggestion. It is hardly necessary to point out what the results would eventually be. Merchants and retailers would demand payment in foreign currency which would force laborers and salaried persons to follow suit and the mark would be eliminated as means of payment. This it is feared would bring about the worst financial and economic crisis that Germany has yet faced.

The Low Mark and Export Trade

The low rate of the mark is responsible for a new regulation announced by the Export Bureau for Rubber. From August, 1922, certain rubber goods will not be allowed to leave the country unless the exporter can show a declaration from the manufacturer proving that the latter agrees to the export of the goods for which a permit is desired. The articles include: pneumatic tires and tubes, solid tires, rubber footwear, canvas shoes with rubber soles, all kinds of soles and heels, bicycle tires and tubes, tennis balls, football bladders, rubber thread, erasers, dental rubber, all kinds of belting, all kinds of hard rubber combs, all kinds of technical goods.

German Notes

The Vereinigte Gummiwarenfabriken Harburg-Wien reports gross profits of 132,179,869 marks for the past year. The previous report stated that profits were 45,552,760 marks. A dividend of 30 per cent will be distributed.

The Hannoversche Gummiwerke Excelsior, Aktien-Gessellschaft Hannover-Limmer intends to double its capital, thereby bringing it to 100,000,000 marks. In April, 1922, the firm increased its capital from 20 to 50 million marks after it had raised its capital from 10 to 20 million marks in November, 1921.

The Vulkan Gummiwarenfabrik Weiss & Baessler A.-G., Leipzig-Lindenau, is showing a novelty recently patented and put on the market under the name *Raspogi*. This is a new kind of a shaving brush. The handle is like the usual kind—of hard rubber, but instead of bristles there is an exchangeable rubber sponge that can easily be removed and cleaned after use. It is claimed for it that it is perfectly hygienic, is easily cleaned or boiled, and does not irritate the skin but acts as a gentle massage.

France

The Paramount Rubber Co., Noisy-le-Grand, Rout de Bry, France, is a subsidiary of Paramount Rubber Consolidated, Inc., Philadelphia, Pennsylvania, and Little Falls, New Jersey, U. S. A., and manufactures rubber bulbs and toy balls by the same methods. The parent company also controls certain special patented machinery and processes for this work, and the types of balls made include inflated, solid, plain, decorated, and those having the design molded in them when constructed.

The Câbles Télégraphiques reports a profit of 10,096,005 francs. The dividend has been fixed at 37.69 per share, 78.90 for the first series and 6.04 for the second series.

The Société la Bakélite, with a capital of 1,400,000 francs, has been formed to study and exploit all the patents and processes of manufacture relating to plastic materials and condensation products and especially of the patent of Dr. Baekeland..

On September 29 the new factories of the Dunlop company at Montluçon, France, were inaugurated. A number of personages connected with the Dunlop company were shown through the new works at Montluçon.

Russia

Russian Rubber Trust Enlarges Activities

The total 1921 production of the Governmental Rubber Trust of Russia, which controls the four leading factories of the country, amounted to 9,986,000 rubles at pre-war prices. During the first half of 1922 the output reached approximately 12,683,350 rubles.

The chief manufactures include rubber shoes and automobile and bicycle tires. For the year 1921 the output of the former amounted to 526,089 pairs; for the first half of 1922 the production had reached 1,838,892 pairs. In 1921, 140,545 sets (casing and tube) of rubber tires were turned out, and 234,596 for the first half of 1922.

The four plants in question include the former Treügolnik factory at Petrograd; the former Bogatyr factory, at Moscow; the former Caoutchouc factory (evacuated from Riga, Latvia) at Moscow; and a branch of the Provodnik works at Peryaslav, in the Government of Vladimir. Although these plants gave employment in 1917 to 21,769 persons, the number had declined to 5,299 on January 1, 1922. Since then, however, the number of workers has been steadily increasing, amounting to 8,701 in July. It is said that the chief difficulty at present confronting the Rubber Trust is the lack of raw materials.

Russian Imports

The United Kingdom exported 1,695 tons of rubber to Russia during September, 1922, as compared with 672 tons sent during the same month to the United States.

Foreign Tariffs

Tire Import Duties as Levied by Latin American Countries

The Division of Foreign Tariffs of the Department of Commerce has tabulated in convenient form the present import duties levied on rubber tires by the Latin American countries. It will be noted that Cuba is the only country mentioned in the list which provides more than one rate of duty on rubber tires. The lower Cuban rate is granted only to products of the United

States. The other countries listed treat tires from all other nations equally, assessing the rates of duty indicated below. In most cases, duties are stated in the local currency of the country of import, with the exact equivalent in American dollars varying with the fluctuations in exchange. The par value is stated in each case; for specific transactions consult daily papers for current rate of exchange.

The metric system of weights and measures is in use in Latin American countries. The kilo is equivalent to 2.2046 pounds, and the ton to 2204.6 pounds.

Argentina

Tariff No.		Valuation, pesos (gold) per legal kilo	Rate of duty, per cent of valuation
363	Rubber tire casings	2.40	25
364	Rubber inner tubes	2.40	25
365	Nonskid casings	1.80	25
1125	Solid truck tires	2.40	25
1539	Pneumatic tires and tubes for bicycles and motorcycles	2.76	25

A surtax of 7 per cent of the valuation is added to above duty. One peso equals $0.965 at normal exchange.

Bolivia

Tariff No.		Rate of duty, bolivianos per kilo
1903	Rubber tires and casings of all kinds (with weight of wrapping)	1.00
1904	Pneumatic inner tubes (with weight of wrapping)	3.00

One boliviano equals $0.389 at normal exchange.

Brazil

Tariff No.		Nominal duty (ad valorem), per cent	Actual duty (ad valorem), per cent
ex808	Pneumatic tires for motor cars. Pneumatic tires marked as of "Fine Pará" are dutiable at 5 per cent of above rates.	15	46.28

The "Actual" duties include 2 per cent gold surtax and the increase due to proportion of duty payable on a gold basis. Duties are actually payable in paper at the current rate of exchange, subject to change in accordance with variations in exchange. Valuation used for customs purposes is c. i. f. value, port of entry.

Chile

Tariff No.		Rate of duty pesos (gold) per gross kilo
ex1616	Parts of automobiles, including solid and pneumatic tires	0.60

One peso equals $0.365 at normal exchange.

Colombia

Tariff No.		Rate of duty, pesos per gross kilo
851	Solid or pneumatic tires of rubber, for motor vehicles, carriages, bicycles, etc.	0.02
854	Wheels for motor vehicles, carriages, carts and other vehicles, with or without rubber tires	0.02
399	Tires either cut or in sections for cutting	0.01

There is in addition a surtax of 7 per cent of the duty. Peso equals $0.973 at normal exchange.

Costa Rica

Tariff No.		Rate of duty, colones per gross kilo
ex68	Rubber tires for carriages, motor cars, and all kinds of vehicles	0.20

Imports through port of Limón pay a surtax of 5 per cent of duty; other ports 2 per cent. One colon equals $0.465 at normal exchange.

Cuba

Tariff No.		General rate (ad valorem)	U. S. rate (ad valorem)
ex227	Tires for motor cars and motor cycles	31.25%	25%
ex229	Tires for motor trucks	31.25%	25%

Dutiable value is wholesale price in principal markets of country of exportation, with cost of packing and expenses incident to placing on vessel for shipment to Cuba.

Dominican Republic

Tariff No.		Rate of duty, dollars per 100 net kilos
ex1046(a)	Rubber tires for motor cars and bicycles	$12.50
(b)	Tires and inner tubes for motor trucks	Free

In order to be admitted free, truck tires must be proved to be for exclusive use of trucks. Inner tubes of less than 11½ mm. shall always be classified under Item No. 1046(a). Duties stated in American dollars.

Ecuador

Tariff No.		Rate of duty, sucres per net kilo
Class 25	Rubber tires	0.45

There is a surtax of 4 per cent ad valorem on all imports, and certain minor charges varying according to commodity. One sucre equals $0.487 at normal exchange.

Guatemala

Tariff No.		Rate of duty, dollars per kilo
1770	Manufactures of rubber not specified (with weight of wrapping)	$2.00

Duty payable in United States gold.

Haiti

	Rate of duty (ad valorem)
Articles not specified (including solid and pneumatic tires)	24% (a)

(a) Includes all surtaxes, except certain slight handling charges. Value in place of production, converted into legal currency at rate of exchange, with an additional 10 per cent added for expenses, used as basis of duty.

Honduras

Supplies for motor cars, including tires, are admitted free.

Mexico

Tariff No.		Rate of duty, pesos per gross kilo
633 (A)	Rubber tires for passenger motor cars	1.00
633 (B)	Rubber tires for motor trucks	.50
	Solid rubber tires fastened to rims or hoops of iron	.50

There is in addition a Federal surtax of 10 per cent of the above duties and a municipal tax of 2 per cent thereof. One peso equals $0.498 at normal exchange.

Nicaragua

Tariff No.		Rate of duty, dollars per net kilo
1082(a)	Rubber tires and inner tubes for carriages, motor cars, bicycles, and the like	$0.60

Panama

	Rate of duty (ad valorem)
Articles not specified (including tires)	15%

Basis of duty is invoiced value of goods. One balboa equals $1 at normal exchange.

Paraguay

Tariff No.		Valuation, pesos per legal kilo	Rate of duty, (ad valorem) per cent
274	Tire casings	3.20	42
275	Inner tubes for tires	3.20	42
276	Nonskid tires	2.40	42
1080	Rubber tires for carriages	2.40	42
1081	Solid truck tires	3.20	42

A surtax of 1.5 per cent of the valuation is added to the duties. One peso equals $0.965 at normal exchange.

Peru

Tariff No.		Rate of duty soles per legal kilo
264	Articles of soft rubber, including bicycles tires and tires for motor cars	1.60

There is a surtax of 18 per cent or 19 per cent of the duty in addition depending upon the port of entry. One sol equals $0.4866 at normal exchange. The proposed new Peruvian tariff provides the following lower rates for tires. It is assumed that the above surtaxes will continue in force. The Division of Foreign Tariffs will announce the new rates and effective date as soon as official notification is received from Peru.

	Rate of duty soles per legal kilo
Tires for motor trucks	0.50
Tires for passenger automobiles	1.00
Solid tires	0.50

Salvador

Tariff No.		Rate of duty, colones per gross kilo
XVII 76	Rubber tires and cement for tires	0.30

One colon equals $0.50 at normal exchange.

Uruguay

	Rate of duty (ad valorem)
Articles not specified (including rubber tires)	31%

C. i. f. value port of entry is used as basis of duty. There is a surtax of 14 per cent ad valorem in addition to duty. One peso equals $1.034 at normal exchange.

Venezuela

Tariff No.		Rate of duty, bolivars per gross kilo
247	Rubber tires	0.75
ex247	Rubber tires, not otherwise specified	0.75
ex248	Inner tubes for motor tires	0.75
875(1)	Solid rubber tires on steel rims for trucks	0.25

There is a surtax of 56.55 per cent of duty in addition. One bolivar equals $0.193 at normal exchange.

Dutch Guiana

	Rate of duty (ad valorem)
Articles not specified (including tires)	10%

Dutiable value is invoice price increased by 20 per cent. One Dutch guilder or florin equals $0.40 at normal exchange.

The Rubber Trade in the Far East

By Our Regular Correspondent

Ceylon

Cables have been received in Colombo, stating that the Secretary for State of Colonies has approved the compulsory restriction of the rubber output in British colonies and territories. The scheme to be adopted will be No. 2 of the Stevenson report of June, 1922, and steps are being taken to put it into effect as from November 1.

The scheme has been very well received in Colombo considering the opposition accorded previous restriction schemes, and has been welcomed as an experiment which deserves to be tested very thoroughly before it is condemned. The question of checking the output of estates is considered to be rather difficult and suggestions of overcoming this difficulty are coming in. One correspondent of the *Times of Ceylon* suggests that the simplest and most effective way would be to control exporters, both estate agents and merchants, instead of the estates themselves. As the number of shippers is far smaller than the number of producers and as the customs authorities are already in possession of the names of all those who have exported rubber during the past few years, this method should be effective.

The Norfolk Rubber Paving

A new method of paving has been devised by Captain A. W. W. Norfolk, of Glen Devon, Halgranoya, Ceylon. His idea is to lay a rubber surface composed first of a non-rusting metal grid of suitable dimensions. Through this grid a rubber compound is pressed so that the surface will take the pattern of rubber blocks while the lower part will consist of a continuous sheet which, however, will leave the four metal sides of each unit free. These sides, forming a frame, will be used for anchoring the unit to the road. The costs, it is said, would be low and any existing road in good condition could be surfaced with very little extra preparation.

Malaya

Mr. Schrieke's Report

The Dutch Rubber Producers' Association, Batavia, recently asked G. G. Schrieke, Director of the Advisory Bureau for Agricultural Affairs and Visiting Agent of Harrisons and Crosfield, Ltd., Batavia, to visit Malaya and report on the conditions prevailing in the local rubber industry.

FIRST ESTATES

Discussing first estate cultivation, Mr. Schrieke places the total area of estates of over 100 acres at 1,303,318 acres, of which 800,000 acres are producing and 503,318 have not yet reached the productive stage. The total exports of estate rubber during the first five months of 1921 were 61,536 tons and for the corresponding period of 1922, 94,715 tons. The increase in exports is held to be largely due to increased production and not to the disposal of 1921 stocks. The 1922 crop is estimated at 180,000 tons. However, export figures include transhipments of rubber from various neighboring producing places as Borneo, Java, Sumatra, etc.; these transhipments may be put at 30,000 tons, so that the figure for production of estates of over 100 acres would be 150,000 tons.

According to the results of the recent rubber census stocks of rubber, including that of native manufacture, amounted to 51,323 tons at the end of 1921. From reliable sources he learned that these stocks had been decreased by 10,000 tons between January and June and that the tendency to diminish continues.

ESTATE MAINTENANCE

Regarding general maintenance and cultivation methods in Malaya, Mr. Schrieke says that these are generally good and in many cases excellent. The influence of drastic economies is visible but no conspicuous deterioration was found nor were cases of estates reverting to jungle noted. Strict attention is paid to budgrafting, especially where extensions are concerned. The system of selection is good and thinning out is adhered to, the average number of trees in a garden of 12 years or older being 76 per acre. In general, the estates do not suffer from disease. Among tapping systems, the alternate period tapping is considered one of the best.

SALARIES, TAXES, AND LABOR

The salaries of European managers and assistants are about the same as those in Java except that the dollar takes the place of the gilder. However, the purchasing power is the same.

As for taxes, half a dollar to a maximum of $4 per acre go for quit rent; an annual assessment of $2 is paid to the government for Tamil coolies; the export duty is leviable when the market price for rubber is $0.35 per pound. An income tax of 20 per cent is levied on companies.

At present labor is plentiful and although Javanese and Chinese are also employed, Tamils are generally preferred. There is abundance of local labor to be had but preference is given to importing labor as $20 per coolie is received from the Immigration Fund as encouragement while the recruiting expenses per coolie are $6 per coolie, so that a credit balance of $14 remains. Wages are moderate, the average daily wage in Johor and Malacca is $0.41; in Negri Sembilan, $0.40; and in Selangor $0.31. In 1920 the average wages per day for Tamils were $0.48; for Javanese $1, and for Chinese $1.50; since then these have fallen considerably and are at present $0.41 for Tamils and Javanese and $0.60 for Chinese.

F. O. B. COSTS

The decrease in the f. o. b. cost prices are given in the following figures of 4 estates situated at great distances from each other:

1921 Per pound	1922 Per pound
42 dollar cents	21 dollar cents
39 dollar cents	28 dollar cents
35 dollar cents	26 dollar cents
26 dollar cents	19 dollar cents

Another example: For the year July, 1921—June, 1922, estate No. 10 had an f. o. b. cost price of $0.28, but in the estimate July, 1922—June, 1923, the cost price is $0.1999, thus:

	Per pound
General charges	$0.08
Hospital	.011
Coolie expenses	.0021
Upkeep rubber in bearing	.0065
Crop	.0626
Manufacture	.0268
Packing and distribution	.0109
Total	$0.1999

It was pointed out that by omitting cultivation and by extending tapping, the price could be still further reduced should circumstances require it. Increased tapping would be brought about by resorting again to daily tapping wherever possible; by extending the system of cutting over one-half the circumference of the tree, and by general introduction of contract tapping. It was further pointed out to the writer that a number of estates are tapping far below capacity so that if the situation became acute, the output could be considerably increased.

NATIVE ESTATES

There are no accurate figures available on estates under 100 acres, but a low estimate is 650,000 acres planted, of which 450,000 acres are in production and 200,000 acres have not yet reached maturity. There are no data regarding crops, but the opinion is that holders of small estates try to make up for low prices by producing big crops. Only in a few instances has tapping been stopped. The opinion is that the average yield per acre is 286 pounds, which would give a total annual crop of 60,000 tons. Authoritative opinion has it that 25 per cent of the trees are worthless or will become so shortly.

Manufacture is in many cases very primitive. The rubber goes to local buyers who send it to the reconditioning factories in the ports. In Singapore alone there are 14 of these factories which

not only work Malayan rubber but also that from Borneo, Palembang, Djambi, Siam, Burma and Cochin China. The imports into Singapore from these parts during the five months February to June, 1922, were 9,956 tons. This rubber comes in the form of unsightly, evil-smelling sheets and the average moisture content is 30 per cent. It is washed on the crêpe mills and turned out as blanket crêpe of four grades. The percentage of these grades and the market price on July 7, 1922, were as follows:

Grade	Per cent	Market price
A	15	$0.23
B	35	.22
C	40	.21½
D	10	.21

There is also a separate grade known as rolled bark, consisting of bark earth rubber and the very lowest qualities. The market price of this is $0.18.

One factory visited by Mr. Schrieke worked continuously, day and night, with 90 crêpe mills and turned out monthly 1,800 tons of blanket crêpe of all grades besides a very great quantity of rolled bark. The cost price of unsmoked native rubber is taken to be around $0.07 per pound. As a rule native rubber passes through two middlemen before reaching the factory. Deducting the profits of the middlemen, factory and the 30 per cent loss of moisture, the net profit to the native works out at from two to four dollar cents (Straits currency) per pound.

In conclusion, Mr. Schrieke remarks that the rubber industry has suffered severely in Malaya, but from the point of view of a competitive struggle, its position is comparatively strong, for: Upkeep of estates is cheap and under the circumstances sufficient; there is at present abundance of excellent labor; wages are not a drawback; there is sufficient bark; the f. o. b. price is low and can be still further reduced; crops can be increased considerably; factories and buildings are kept in reasonably good condition; the condition of health is satisfactory.

Therefore, the writer is convinced that a struggle for the survival of the fittest is absolutely hopeless and would only lead to exhaustion of both parties, Malaya and the Netherlands East Indies.

Fight for Rubber

Under this title the *Straits Budget-Rubber Supplement*, the weekly number of the *Straits Times*, publishes a long article by A. W. S. The writer takes into consideration the surplus stock which he puts at 200,000 tons by the end of 1922 and goes on to show that even if consumption increases annually, the surplus would not be diminished owing to increased output and crop from new areas.

The consumers in their own interests would keep prices at their present level and at the same time see that surplus stocks did not increase. By forward contracts with the Dutch and by control over surplus stocks, consumers would effectively throttle the industry in Malaya unless a bold fight were put up. And the bold course would be for Malaya to stop producing output altogether for a year.

It is not probable that more than 248,000 tons would be available for consumers by 1924 if Malaya ceased producing. And if consumption were around 400,000 tons there would be a shortage of 62,000 tons which would create a panic among consumers. Then Malaya could step in and produce and sell on her own terms. A great combined selling agency should be formed through which contracts for supply would be made on the forward basis up to the full limit of Malayan output capacity.

The cost of a year's suspension of production would be about £10,500,000 an outlay that could easily be recovered by the scarcity prices in 1924. As for the mode of restriction, if it were decided that only 50 or 75 per cent of the 1922 output be cut out, then an export duty of 100 per cent ad valorem should be imposed; if total cessation of production is resolved upon, then the duty should be 200 per cent ad valorem. For the working of the scheme a loan of £15,000,000 should be raised, and producers should receive 20 cents per pound for each pound restricted. Full labor force would have to be maintained and when not used for caring for rubber estates, should be employed for experimental crops other than rubber where land is available. The repayment of the loan could be effected by imposing a duty of 10 cents per pound on each pound of rubber after scarcity prices have been established.

Netherlands East Indies

The Director of the A. V. R. O. S. (Association of Rubber Producers, East Coast of Sumatra) experimental station has returned from a trip to Java and in an interview by the *Deli Courant* he gives his impressions of the situation in the Java rubber industry.

In Java, 38 estates, mostly small private enterprises, have been closed down, whereas only three have stopped work in East Coast of Sumatra. Labor is cheaper but a tapper does not work all day as is the case in Sumatra. There are cheap producers but also many that are expensive. While in Sumatra dismissal of coolies amounts to loss of capital, in Java every estate can cease work any time it pleases because labor can always be obtained. There is an increasing number of people in favor of restriction. Results with bud-grafting in Java are really satisfactory.

On the whole, the Director was of opinion that Java was suffering less from the slump than Sumatra. Especially the estates cultivating a variety of crops are doing well.

Central Factory for Preparing Rubber

At a recent meeting of the Department of Hill Crops of the Society for the Promotion of Agriculture and Industry at Djambi, Dr. O. de Vries lectured on the judgment, grading and preparation of rubber now and in the future. Dr. de Vries said that uniformity and a simple method of preparation are desirable. Making blanket crêpe in central, cooperative factories is of the greatest importance. This crêpe is less susceptible to defects, especially mold, than thin crêpe or even smoked sheet. The Director plans to erect a central factory at Batavia for his fifteen enterprises, which would reduce the costs of preparation by about 8 gilder cents per kilo. (Kilo = 2.2 pounds.) This saving is effected through the simplification of work in one factory and the lower costs of administration besides the elimination of extra factories.

Netherlands Notes

Here, too, rubber companies are acquiring machinery for making rubber articles like heels and soles which find a ready sale on the local market. The making of hats for men is also being considered. It seems to be the opinion that the well-beloved derby could be made of rubber with a thin layer of felt over it.

On a certain estate, a dwarf tractor train is being used on unhardened red clay roads. The driving wheels have 31 by 3½ dual penumatic tires equipped with special American nonskid chains. The total capacity of the whole train is 3.5 tons with a loading surface of about 17 square meters.

Japan

It is reported that Japanese rubber planters in the East have been hard hit and they have addressed the Nanyo-Planters Bond at Tokio with a view to getting financial assistance. This company is trying to get a loan of 100,000,000 yen at low interest for the needy planters. Of this amount, 34,000,000 yen would be used to pay back short term loans from the Bank of Japan and others, and the remaining 66,000,000 yen to continue the work of cultivation. The Japanese estates in Malaya, British North Borneo and Sumatra cover an area of 313,000 acres of which 110,000 acres are planted with rubber. Altogether more than 40,000,000 yen has been invested in rubber by the Japanese.

THE BUSINESS FORMERLY CARRIED ON BY COLAUTTI & CIA., Defensa 321, Buenos Aires, Argentina, South America, will in the future be continued by A. Colautti. The company manufactures and deals in rubber goods.

Recent Patents Relating to Rubber

The United States

Issued* October 3, 1922

NO. 1,430,742 Garter and garment supporter. R. N. Klass, Des Moines, Ia.

1,430,795 Air tube for pneumatic tires. D. J. Chappell, Llanelly, Wales.

1,430,868 Ballast device for aircraft. W. B. Weyrick, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.

1,430,981 Rug corner of rubber. C. F. Goldthwaite, assignor to Klearflax Linen Rug Co.—both of Duluth, Minn.

1,431,011 Swimming tube and valve cap therefor. G. D. Kratz, Akron, assignor to The Falls Rubber Co., Cuyahoga Falls—both in Ohio.

1,431,069 Punctureproof tire. J. M. Ward, Jarrettsville, Md.

Issued* October 10, 1922

1,431,177 Inhaling device. R. Palmer, Teaneck, N. J.

1,431,262 Garter. J. K. Seymour, Elyria, Ohio.

1,431,315 Waterproof diaper. C. Le Moine, Sioux City, Ia.

1,431,323 Bicycle tire. J. Muszynski, Collinsville, Conn.

1,431,345 Tire with reinforced cork inner core. G. Velting, Sr., Scarsdale, N. Y.

1,431,484 Antiskid tire shoe. G. A. Payne, Connellsville, Pa.

1,431,538 Fountain pen. O. Mitchell, Brookline, Mass.

1,431,539 Fountain pen. O. Mitchell, Brookline, Mass.

1,431,540 Pneumatic tire. R. Osgood, Torquay, England.

1,431,596 Inner tube for tires. H. L. Pixley, Cleveland, Ohio.

1,431,623 Heel rest. W. Bernstein, Jamaica Plain, Mass.

1,431,732 Ball. C. D. Hoppes, assignor to The Faultless Rubber Co.—both of Ashland, Ohio.

1,431,762 Nursing nipple. H. A. Sellers, Roxbury, Mass.

1,431,785 Pneumatic tire having small air spaces in tread part beneath projecting nonskid portions. E. J. Emery, Lynn, Mass.

1,431,842 Hand stamp with flat-folding handle. S. A. Rauch, New York, N. Y.

1,431,878 Pneumatic wheel. J. W. Dixon, Connellsville, Pa.

Issued* October 17, 1922

1,431,943 Pneumatic comb. H. M. Gee, Cleveland, Ohio.

1,431,957 Ozone generator. E. L. Joseph, Westminster, London, England.

1,432,013 Exercising device. F. H. Blake, Toronto, Ontario, Canada.

1,432,158 Rubber and spring tire. C. D'Aiuto, Cleveland, Ohio.

1,432,333 Air seal lock pneumatic inner tube. C. C. Harmon, Portland, Me.

1,432,392 Pedal rubber. R. S. Heise, assignor to Miami Cycle & Manufacturing Co.—both of Middletown, Ohio.

1,432,398 Emergency automobile tire. W. T. and W. W. King, Alliance, Ohio.

1,432,468 Combined eraser and lead holder. C. R. Keeran, assignor to Realite Pencil Manufacturing Co.—both of Chicago, Ill.

1,432,470 Corset with elastic sections. D. Kops, assignor to Kops Brothers, Inc.—both of New York, N. Y.

1,432,471 Protecting mask for boxing pupils. N. Lacrotte, Paris, France.

1,432,477 Brassière. I. Roth, Brooklyn, N. Y., assignor to Benjamin & Johnes, a New Jersey corporation.

1,432,483 Inner tube protector. A. J. Michelin, Paris, France.

1,432,515 Balloon kite. J. M. Allison, assignor of ½ to E. W. Trook—both of Indianapolis, Ind.

1,432,525 Dust cap. A. E. Bronson, Cleveland, Ohio.

1,432,540 Automobile wheel. E. Deister, Fort Wayne, Ind.

1,432,603 Rim and tire construction with independent pneumatic tubes within shoe. H. E. A. Landsmand, Hoboken, N. J.

1,432,613 Dust cap. J. R. Orr, Los Angeles, Calif.

1,432,617 Cushion heel. A. K. Pomeroy, Washington, D. C., assignor to F. Higgins, Rockville, Md., trustee for the shareholders of The International Shoe Heel Corporation.

1,432,692 Button for hose supporters. C. J. Hazelton, assignor to American Narrow Fabric Co.—both of Worcester, Mass.

1,432,693 Hose supporter. C. J. Hazelton, assignor to American Narrow Fabric Co.—both of Worcester, Mass.

1,432,694 Hose supporter button. C. J. Hazelton, assignor to American Narrow Fabric Co.—both of Worcester, Mass.

Issued* October 24, 1922

1,432,869 Tire valve. H. P. Kraft, Ridgewood, N. J.

1,432,961 Molded sole. M. Brown, Boston, Mass.

1,433,006 Tire patch. C. V. Hall, Washington, D. C.

1,433,008 Pneumatic tire. C. G. Hawley, Chicago, Ill.

1,443,104 Apparatus for administering anesthetic gases. R. von Foregger, Roslyn, N. Y.

1,433,108 Cap crown protecting device. J. H. Boucher, Cambridge, Mass.

1,433,184 Electric massage apparatus. H. Csanyi, New York, N. Y.

1,433,222 Self-filling fountain or reservoir pen. F. T. O'Hanlon, Liverpool, England.

1,433,301 Cushion tire. A. A. Robb, Akron, Ohio, assignor to The B. F. Goodrich Co., New York, N. Y.

1,433,312 Combination pneumatic tire casing and rim. J. Velcio, assignor of ⅓ to C. A. Harpman and ⅓ to D. A. Frampton—all of Youngstown, Ohio.

1,433,325 Fountain pen. A. Winter, Jersey City, N. J., and P. S. Morgan, Norwalk, Conn., assignors to S. E. Darby, Jr., trustee, East Orange, N. J.

1,433,338 Sectional vehicle tire. F. H. Bommarius and P. Carollo, New Orleans, La.

1,433,467 Fabric for receiving rubber composition. F. B. Manley, Baltimore, Md., assignor, by mesne assignments to Textiles Development Corporation, New York, N. Y.

Issued* October 31, 1922

1,433,573 Elastic fabric breast supporter and reducer. F. J. Stuart, St. Louis, Mo.

1,433,676 Eye goggles with rubber chambers and bridge. H. S. Cover, South Bend, Ind.

1,433,679 Combination blood pressure and respiration instrument. E. L. Fisk, New York, N. Y.

1,433,682 Fountain pen. H. A. Funk, assignor of 49 per cent to R. C. Coney—both of Chicago, Ill.

1,433,902 Shoe tread with removable cushions. J. E. Masters, Hartford, Conn.

1,434,169 Combination garment with elastic straps. E. A. Van Winkle, Waverly, Ill.

1,434,222 Demountable tire rim. L. H. Perlman, New York, N. Y., assignor to General Motors Corporation, a Delaware corporation.

1,434,223 Demountable rim locking device. L. H. Perlman, New York, N. Y., assignor to General Motors Corporation, a Delaware corporation.

*Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Granted October 3, 1922

224,205 Resilient tire. M. O'Bannon, Detroit, Mich., U. S. A.

224,308 Dust cap for tires. The Dill Manufacturing Co., assignee of H. J. Hansen—both of Cleveland, Ohio, U. S. A.

224,411 Parachute. E. R. Cathrop, London, Middlesex, England.

224,445 Golf game device used with soft captive ball. N. Pemberton-Billing, Hertford, Hertford County, England.

224,450 Tone foot for phonographs. W. H. Prickett, Trenton, N. J., U. S. A.

224,536 Pressure gage for tires. The Tirometer Valve Corporation of America, assignee of A. Badowski—both of Charleston, W. Va., U. S. A.

Granted October 10, 1922

224,541 Resilient stamp pad. R. H. Kee and W. K. Munson, coinventors—both of Los Angeles, Calif., U. S. A.

224,572 Tire valve. G. E. Draper, Pittsburg, Kans., U. S. A

Granted October 17, 1922

224,781 Garment supporter for hosiery. F. E. Howard, Watsonville, Calif., U. S. A.

224,894 Resilient tread for footwear. F. A. Nolan, St. Paul, Minn., U. S. A.

224,896 Parachute. H. K. Reeves, London, England.

The United Kingdom

Published October 4, 1922

184,331 Vehicle splash guard with rubber flap. F. A. Ballard, Venloo, Mount Lane, Monkspath, Shirley, near Birmingham.

184,439 Bottle closure. J. Bengue, 47 Rue Blanche, Paris, France. (Not yet accepted.)

Published October 11, 1922

184,494 Rubber tire valve. W. Ruston, 25 Cobden Road, and A. Clark, 1 Acacia Road—both in Leytonstone, London.

184,528 Tire valve. R. W. Baker, 2 College Road, Great Crosby, Liverpool.

184,588 Hard rubber telephone mouthpiece. Western Electric Co., Limited, Norfolk House, Victoria Embankment, Westminster, and L. Van Rutten, 11 Rue Fourment, Antwerp, Belgium.

Chemical Patents will be found on pages 152-153; Machinery and Process Patents on pages 158-159

184,600 Rubber concentrator cap for telephone mouthpieces. A. Marr, 23 Reynell Road, Longsight, Manchester.

184,614 Siphon. J. Gallimore, 14 Sneyd street, Tunstall, Stoke-on-Trent.

184,701 Detachable rubber studs for football boots. G. Bell, 111 Union street, Glasgow, Scotland.

184,735 Rubber-tipped bottle cleaning brush. J. Forshaw, Hemans street, Bootle, Liverpool.

184,758 Vulcanized fiber sole for dancing footwear. J. Finnigan, 211 Gallowgate, Glascow, Scotland.

184,783 Electric cables. Western Electric Co., Limited, Norfolk House, Victoria Embankment, Westminister; assignee of J. G. Roberts, Hastings-on-Hudson, N. Y., U. S. A. (Not yet accepted.)

Published October 18, 1922

184,849 Electric wiring system having non-insulated wires encased in tubing of vulcanized rubber, rubber and fiber, or similar material. L. J. Lepine, 12 Kenwood Road, Stretford, Manchester.

184,851 Liquid container valve with rubber sleeve. G. H. Potts, 99 Finsbury Pavement, London.

185,029 Elastic abdominal belt. F. J. Stuart, 1110 Locust street, St. Louis, Mo., U. S. A.

185,057 Rubber mud guard. T. T. MacDougall, 67 Iona street, Leith, Mid Lothian.

185,065 Corset with suspenders. L. J. A. Amyot, 29 Dorchester street, Quebec, Canada.

185,130 Tire tread. Goodyear Tire & Rubber Co., 1144 East Market street, assignee of P. W. Litchfield, 38 Marshall avenue—both of Akron, Ohio, U. S. A. (Not yet accepted.)

Published October 25, 1922

185,164 Rubber football valve. W. Ruston, 25 Cobden Road, and A. Clark, 1 Acacia Road—both in Leytonstone, London.

185,296 Buoyant swimming and bathing dress. C. Keith, 2 Cecil Road, Wimbledon, London.

185,333 Golf machine. P. G. Crane, 30 Douglas Road, Acocks Green, Birmingham.

185,347 Rubber shaving brush. H. J. and T. A. Hardware, 22 Holmsdale Road, Great Heath, Coventry.

185,369 Sandal with rubber studs. L. H. Yersin, The Light House, Park Place and F. R. Ball, Cragside, St. Luke's Park—both in Torquay.

New Zealand

Published August 24, 1922

48,123 Pneumatic tire. F. Creassey, 106 Upper Parliament street, Nottingham, Eng.

Germany

Patents Issued, with Dates of Issue

362,895 (July 10, 1920) Subcutaneous syringe. Dr. Luigi Perruchini, Milan; represented by M. Abrahamson, Berlin S. W. 47.

363,035 (October 27, 1921) Pressure tire with two or more air tubes. Carl Puff, Sedanstrasse 8, Spandau.

363,434 (April 27, 1920) Valve for pneumatic tires. Rudolf Rödiger, Giessen.

363,772 (July 2, 1920) Packing ring. Roman Schachinger, Linz, Austria; represented by Glowacki, Berlin S. W. 61.

363,939 (September 20, 1921) Pessary. Dr. Wilhelm Key, Klinikstrasse 40, Giessen.

364,006 (September 18, 1921) Pneumatic tire. Harlan Samuel Rector, Chicago, United States; represented by Caminer, Berlin W. 62.

364,087 (May 10, 1922) Pessary for therapeutic treatment of vagina and uterus. Dr. Julius Frankenstein, Kaiser Wilhelmplatz 5, Berlin-Schöneberg.

364,109 (June 8, 1921) Stuffing-box packing. Carl Heinrich Räger, Nienburg-on-the-Weser.

364,143 (April 13, 1921) Heel patch of rubber or the like with exchangeable tread surface. William David Sternberg, London; represented by J. Tenenbaum and Dr. H. Heimann, Berlin S. W. 68.

364,255 (July 9, 1920) Labyrinth packing. International General Electric Co., Inc., New York, United States; represented by Benjamin & Werthe'mer, Berlin S. W. 11.

364,295 (November 21, 1920) Valve for bladder of sport balls. Gutkind & Einstein, Nürnberg.

Design Patents Issued, with Dates of Issue

826,439 (September 4, 1922) Children's comforter. Wilhelm Pichmann, Sybelstrasse 42, Charlottenburg.

826,493 (January 15, 1921) Inhaling apparatus. Paul Maletz, Bad Reichenhall.

826,536 (September 1, 1922) Warming cushion, can also be used as irrigator. Gustav Baldauf, Seestrasse 5, Munich.

826,652 (July 1, 1922) Solid tire with spring. Johannes Ahrends, Hohepfortestrasse 55, Magdeburg.

826,699 (January 23, 1922) Holder for sanitary napkins. Radium-Gummiwerke, Köln-Dellbrück.

826,706 (April 25, 1922) Sanitary binder. Otto Cantzler, Carlstrasse 6, Potsdam.

827,201 (September 8, 1922) Injection syringe. Dr. Hermann Müller, Moosburg a. Inn.

827,214 (September 11, 1911) Rubber cap for bottles. Walter Bleihauer, Härtelstrasse 14, Leipzig.

827,235 (June 30, 1922) Sole of rubber or the like. Wilhelm Kaufmann, Eupen; represented by A. Kuhn, Berlin S. W. 61.

827,244 (August 9, 1922) Rubber sole patch. Carl Müller, Kaiserstrasse 64, M.-Gladbach.

827,337 (July 19, 1922) Rubber heel; three-part rubber sole. Paul Balke, Röhrendamm 187, and Gottfried Kopp, Holstenstrasse 11, both Hamburg.

827,340 (July 25, 1922) Washable impregnated rubber clothing. Adolf Traut, Cäcilienkloster 5, Köln-am-Rhein.

827,345 (August 15, 1922) Rubber heel with rounded edge. Erhard Bornhütter, Stromstrasse 5, Düsseldorf.

827,362 (August 29, 1922) Shoe with exchangeable rubber plugs in the soles. Johann Bohlich, Görlitz.

827,370 (September 7, 1922) Rubber ring for penholders and pencils to prevent dirtying the fingers when writing or breaking of the point when pencil is dropped. Franz Vollmer, Hörde i. W.

827,419 (August 29, 1922) Exchangeable rubber heel. Albert Gulder and Max Krausz, Kötzschenbroda.

827,593 (July 31, 1922) Shoes with rubber soles. Friedrich Theilmann, G. m. b. H., Frankfort-on-the-Main—Niederrad.

827,594 (August 2, 1922) Infants' rubber pants. Radium Gummiwerke, G. m. b. H., Köln-Dellbrück.

827,622 (September 5, 1922) Rubber sole. Carl Reinshagen, Ronsdorf, Rheinland.

827,787 (September 11, 1922) Elastic bands, particularly for garters. Firma M. Steinberg, Köln-Lindenthal.

827,841 (September 15, 1922) Rubber heel with press button attachment. Arthur Rascher, Niederplanitz bei Zwickau.

827,993 (September 18, 1922) Shoe sole with exchangeable rubber and exchangeable nails. Karl Walter, Gartenstrasse 105, Heilbronn.

828,098 (September 21, 1922) Rubber floating toys that can be attracted by magnets. Max Manfred v. d. Heyden, Leipzigerstrasse 119-120, Berlin.

828,116 (May 29, 1922) Pneumatic tire with automatic closing of injured parts. Colin Ross Crombie and James Beveridge Smith, Edinburgh; represented by Dr. Döllner, Seiler and Malmecke, Berlin S. W. 61

828,245 (August 17, 1922) Threaded rubber heel attachment. Karl Güder, Günnigfeld, Kr. Gelsenkirchen.

828,307 (August 21, 1922) Umbrella covering of rubber. Joh. Klasner, Karthaus, Rheinland.

828,334 (September 21, 1922) Rubber sole. Continentale Isolawerke A.-G., Birkesdorf, near Düren.

828,343 (June 16, 1920) Closing for rubber bladders of footballs and other balls. L. Rammelsberger, Hengersberg.

828,670 (August 25, 1922) Clamps for holding rubber drains for surgical purposes. Firma C. Stiefenhofer, Munich.

828,725 (August 24, 1922) Air tube protector. Franz Reker, Holsterhauserstrasse 33, Essen.

828,784 (August 25, 1922) Surgical syringe. Albert Kühn, Vesser bei Schedefeld, Kr. Schleusingen.

828,938 (October 2, 1922) Tire protector. Josef Ainhirn, Bad Aussee; represented by A. Kuhn, Berlin, S. W. 61.

829,064 (June 27, 1921) Irrigator. Laura Neustadt, Alte Schönhauserstrasse 2, and Caesar Haeseler, Frankfort-on-the-Main—Preungesheim.

Trade Marks

United States

Two Kinds of Trade Marks Now Being Registered

Under the rules of the United States Patent Office, trade marks registered under the Act of February 20, 1905, are, in general, fanciful and arbitrary marks, while those registered under the Act of March 19, 1920, Section 1 (b), are non-technical, that is, marks consisting of descriptive or geographical matter or mere surnames. To be registered under the latter act, trade marks must have been used for not less than one year. Marks registered under this act are being published for the first time when registered, any opposition taking the form of an application for cancellation.

Granted October 3, 1922, Act of February 20, 1905

159,701 GOODRICH—rubber cement, repair gum, and repair outfits. The B. F. Goodrich Co., New York, N. Y.

Granted October 10, 1922, Act of February 20, 1905

159,795 AMBASSADOR—pneumatic tires. Ambassador Tire Corporation, New York, N. Y.

159,796 AICO within base of triangle formed and decorated in stencil effect—electrical insulation and molded plastic insulating compositions. American Insulator Co., New Freedom, Pa.

159,807 BERGOUGNAN TIRES, TRENTON, N. J., on yellow disk—tires. Bergougnan Rubber Corporation, Wilmington, Del.; and Trenton, N. J.

159,812 BLECO—tires and tubes. Blekre Tire & Rubber Co., St. Paul, Minn.

159,813 Representation of a tire surrounding a dog's head holding in its mouth a placard bearing the word BRAENDER, and on the tire the name and address of the company—tires, tire casings, and inner tubes. Braender Rubber & Tire Co., Rutherford, N. J.

159,855 TRANSPORT—tire casings and inner tubes. Corona Cord Tire Co., East Butler, Pa.

159,860 CULP PLAN—tires, particularly solid tires, and casings and inner tubes of pneumatics. George K. Culp, Inc., Wilmington, Del., and New York, N. Y.

159,863 DALCO—tires. C. J. Dalton as C. J. Dalton Co., New York, N. Y.

159,865 Representation of a seal bearing the word DORO on a shield in the center; the words QUALITY WITH SERVICE on three conventionalized scrolls surrounding the shield; and the name and address of the manufacturer surrounding all—belting, hose, and machinery packing. The Doermann-Roehrer Co., Cincinnati, O.

159,870 DUPONT within stenciled oval over the word MINEFAB—waterproofed fabrics. E. I. du Pont de Nemours & Co., Wilmington, Del.

159,874 FARRAN-OID DUAL FLEX—belts and belting made of a composition of rubber, cotton fabric, and cord for automobile and power transmission. Farran-Kinney Co., Chicago, Ill.

159,883 SUMMIT—belting, hose, and packing. The B. F. Goodrich Co., New York, N. Y.

159,884 GOODRICH on a conventionalized scroll superimposed above "55"—tire casings. The B. F. Goodrich Co., New York, N. Y.

159,885 Representation of track of a tire within diamond outline around the four sides of which are the words: GOODYEAR ALL-WEATHER TREAD ON THE HIGHWAYS OF THE WORLD—tires. The Goodyear Tire & Rubber Co., Akron, O.

159,903 HOLMAC 6-6—golf balls. Holmac, Inc., New York, N. Y.

159,904 HOLMAC 1-1—golf balls. Holmac, Inc., New York, N. Y.

159,905 HOLMAC 3-3—golf balls. Holmac, Inc., New York, N. Y.

159,920 YELLOW JACKET TIRE PATCH and representation of wasps hovering over a tire—rubber patches. Justa Manufacturing Co., Oklahoma, Okla.

159,929 GIANT GRIP—inner tire rubber patches. L. F. Lee as Lee Rubber Co., Waukesha, Wis.

159,931 LIBERTY and figure of Liberty standing on a rectangle beside another rectangle—rubber tire patch. Liberty Patch Co., Oklahoma, Okla.

159,941 MCKONE MADE within oval with pointed ends—tires. The McKone Tire & Rubber Co., Millersburg, O.

159,946 BROWNDELL—asbestos and rubber brake lining. The Manhattan Rubber Manufacturing Co., Passaic, N. J.

159,947 DURO—piston and piston rod packing made of textile fabric and rubber cement. Johns-Manville, Inc., New York, N. Y

159,951 Representation of a section of hose showing woven into its jacket a colored transverse filler thread—fabric-covered hose with metal lining. Metal Hose & Tubing Co., Inc., Brooklyn, N. Y.

159,958 EZPAR—tents, tarpaulin, and wagon covers. Mount City Duck and Rubber Co., St. Louis, Mo.

159,961 NASCO—tires, tubes, and repair patches. National Auto Supply Co., Allentown, Quakertown, and Easton, Pa.

159,968 THE MILEAGE ACE on representation of section of a tire—tires. The New Tread Tire Co., Columbiana, O.

159,971 NACO within diamond on conventional representation of a tire within a square—belting, hose, tires, casings, tubes, patches, inner liners, and brake linings. Nott-Atwater Co., Spokane, Wash.

159,977 Representation of the two hemispheres side by side with band across middle bearing words OVERSEAS MOTOR SERVICE CORPORATION—tires; shoes, patches, plugs, and treads for tires; and tire covers. Overseas Motor Service Corporation, New York, N. Y.

159,990 POCOTOP—waterproofed and rubberized fabrics. Pocono Rubber Cloth Co., Trenton, N. J.

159,993 KLINGER—tires and tubes. Racine Rubber Co., Racine, Wis.

159,994 RACINE TRUSTY—tires. Racine Rubber Co., Racine, Wis.

159,997 GIANT RED and representation of a crescent—rubber and fabric machinery packing. Revere Rubber Co., Providence, R. I., and Chelsea, Mass.

160,005 IRON MAN—suspenders. The Russell Manufacturing Co., Middletown, Conn.

160,008 PEARL—fruit jar rings. Schloss Manufacturing Co., San Francisco, Calif.

160,009 ASTER—fruit jar rings. Schloss Manufacturing Co., San Francisco, Calif.

160,010 EMERALD—fruit jar rings. Schloss Manufacturing Co., San Francisco, Calif.

160,011 RED SLASH on left red half of a square divided by oblique line into red and white sections—fruit jar rings. Schloss Manufacturing Co., San Francisco, Calif.

160,012 PEONY—fruit jar rings. Schloss Manufacturing Co., San Francisco, Calif.

160,013 LAGFACE—belting. Security Rubber and Belting Co., Chicago, Ill.

160,014 SHAPLEIGH within diamond outline—pneumatic tires and tubes. Shapleigh Hardware Co., St. Louis, Mo.

160,018 SIMPLEX and conventional representation of spread wings—pneumatic tires. Simplex Tire & Rubber Co., Chicago, Ill.

160,021 Representation of a tire surrounding a picture of a tree with a man standing beneath it—tires and tubes. George Spencer-Moulton & Co., Ltd., London and Westminster, London, Eng.

160,023 WHITE OWL TUBE PATCH—sheet rubber patches known as White Owl. W. W. Stiles, Gretna, La.

160,034 ASBESTOS-CUSHION—fabric, brake, and transmission lining. United States Asbestos Co., Lancaster, Pa.

160,035 E within stenciled diamond—cotton and rubber hose. United States Rubber Co., New Brunswick, N. J., and New York, N. Y.

160,075 WILCO—rubber, fabric, and leather belting. The M. I. Wilcox Co., Toledo, O.

Granted October 17, 1922, Act of February 20, 1905

160,121 ALLIED 162 MERCURY—golf balls. Allied Golf Co., Chicago, Ill.

160,123 O. N. S.—brassières, corsets, hose supporters, etc. American Lady Corset Co., Detroit, Mich.

160,156 A spread eagle surmounting a conventionalized shield above a scroll—raincoats, etc. The Comer Manufacturing Co., Dayton, O.

160,178 Caricature figurine of a golfer—golf balls. Dunlop Tire and Rubber Corporation of America, Buffalo, N. Y.

160,191 SUPERBILT—inner tubes. Funsten Brothers & Co., St. Louis, Mo

160,197 HIPPO—rubber belting. Goodyear Rubber Co., San Francisco, Calif.

160,210 H within a heavy black circle—golf balls. Holmac, Inc., New York, N. Y.

160,212 INVULNER—puncture-sealing compound. J. Houdry & Fils, Paris, France.

160,220 FLATTER-U—brassières and corsets. The Kabo Co., Chicago, Ill.

160,236 MASON within a triangle, so drawn that the legs of the letter M also form those of the A and N with the S and O between them—fluidtight packing with resilient composition backing. Mason Packing Co., Pittsburgh, Pa.

160,313 GIMICK printed vertically and horizontally arranged in the form of a cross with central space between the syllables—tire-inflating devices. Tire Inflator Co., Philadelphia, Pa.

Granted October 24, 1922, Act of February 20, 1905

160,368 Representation of a target having the letter A in the bull's-eye and the words THE ANCHOR PACKING COMPANY TARGET SHEET repeated on the concentric rings—asbestos and rubber machinery packing. The Anchor Packing Co., Philadelphia, Pa.

160,380 "FOR PEACE OF MIND"—tires and tubes. Automobile Owners' Tire Corporation, St. Paul, Minn.

160,399 PERFECTION—fibrous or rubber belting. Boston Woven Hose & Rubber Co., Cambridge, Mass.

160,411 LOSANT within a double outline diamond—belting, hose, and packing. The Cincinnati Rubber Manufacturing Co., Norwood, O.

160,438 F-S—tires. Cupples Company Manufacturers, St. Louis, Mo.

160,439 PRESTO—jar rings. Cupples Company Manufacturers, St. Louis, Mo.

160,452 DUDLEY'S above representation of a leaf—chewing gum. Dudley Gum Co., Nashville, Tenn.

160,460 TANK—fountain pens. Dunn-Pen Co., Inc., New York, N. Y.

160,462 Representation of a child and a small dog being blown away by a bunch of balloons which the child is grasping—toy balloons. The Eagle Rubber Co., Ashland, O.

160,466 Representation of a red label divided into two parts: one bearing portrait of R. Esterbrook, the numerals 1858, and the name Esterbrook, the other being decorative, and both bearing the company name in the handwriting of R. Esterbrook—fountain pens. The Esterbrook Steel Pen Manufacturing Co., Camden, N. J.

160,473 "WEAREVER"—golf balls. The Faultless Rubber Co., Ashland, O.

160,474 "FAST FLIGHT"—golf balls. The Faultless Rubber Co., Ashland, O.

160,484 FOWLER—blowout boots for tires. Fowler-Williams Co., Dallas, Tex.

160,503 RHINO—rubber belting. Goodyear Rubber Co., San Francisco, Calif.

160,535 "FLEXICORD"—tires. The India Rubber, Gutta Percha & Telegraph Works Co., Ltd., London, Eng.

160,536 Conventional geometrical design—rubber and fabric hose. Ingersoll-Rand Co., Jersey City, N. J., and New York, N. Y.

160,546 RIDE ON AIR and KANE'S against background of seagulls hovering over the ocean—pneumatic shock absorbers. The Kane Sales Co., Centralia, Wash.

160,587 MOORERITE—fountain pens. The Moore Pen Co., Boston, Mass.

160,608 LETO within a heavy circle—tires. The Norwalk Tire and Rubber Co., Inc., Norwalk, Conn.

160,634 MONEY SAVER—patches for rubber goods. The Porteous Products Corporation, Inc., New York, N. Y.

160,637 RACINE KLINGER—tires. Racine Rubber Co., Racine, Wis.

160,640 RUBY above representation of one large ruby and two small ones—jar rings.

160,647 CHEROKEE—belting. The Rossendale-Reddaway Belting & Hose Co., Newark, N. J.

160,653 VELVET—rubber floor tiling. W. H. Salisbury & Co., Inc., Chicago, Ill.

160,667 MONTBLANC above conventionalized disk—fountain pens. Simplo Füllfeder-Gesellschaft Voss, Lausen & Dziambor, Hamburg, Germany.

160,692 TMC as a monogram within a diamond superimposed over the bull's-eye of a conventionalized target—windshield wipers. Turnstedt Manufacturing Co., Detroit, Mich.

160,739 WILSTAND—rubber fabric and leather belting. The M. I. Wilcox Co., Toledo, O.

160,742 WINGO'S EVER-STICK PATCHING and picture of two little girls holding hands—inner tube patches. J. S. Wingo, Spartanburg, S. C.

Act of March 19, 1920, Section 1 (b)

160,760 WHISTLER DOUBLE DUTY TUBES and the words "LIKE AN ALARM CLOCK" above picture of an alarm clock standing beside a tire being inflated and representation of musical notes being given off by both—inner tubes. E. W. Bentley, Oklahoma, Okla.

160,763 "THEY LAST LONGER"—waterproof bloomers and baby pants. Brooklyn Shield & Rubber Co., Brooklyn, N. Y.

160,768 CONKLIN—rubber erasers. The Conklin Pen Manufacturing Co., Toledo, O.

160,776 SEMI-PNEUMATIC—internally channeled or chambered rubber cushion tires. The B. F. Goodrich Co., New York, N. Y.

160,791 MALAY—tires and casings of rubber with cord or fabric linings, and inner tubes. The Malay Rubber Co., Cleveland, O.

160,797 NEW PROCESS CORD—tires. New Process Co., Warren, Pa.

160,808 "WEATHERS ANY WEATHER" within an oval— waterproof fabrics. Schwarzwaelder Co., Philadelphia, Pa.

Granted October 31, 1922, Act of February 20, 1905

160,852 TUF-TR-EAD—insulated wire. Detroit Insulated Wire Co., Detroit, Mich.

160,853 SUPERADIO—radio receiving sets, etc. De Witt-La France Co., Cambridge, Mass.

160,856 EDELMAN'S RAYTAINOR—radio parts. P. E. Edelman, New York, N. Y.

160,860 E with representation of electricity emanating from it in four directions—head receivers and other radio apparatus. Everett Electric Corporation, New York, N. Y.

160,898 Boy's DELIGHT—combination package of boys' athletic goods, including joy ball, football, bladder, etc. Ken-Wel Sporting Goods Co., Gloversville, N. Y.

160,929 ANOLIDE—rubber accelerators, compounding ingredients, etc. National Aniline & Chemical Co., Inc., New York, N. Y.

160,930 PARYLINE—rubber accelerators, compounding ingredients, etc. National Aniline & Chemical Co., Inc., New York, N. Y.

160,931 PHENALDINE—rubber accelerators, compounding ingredients, etc. National Aniline & Chemical Co., Inc., New York, N. Y.

160,932 THANILIDE—rubber accelerators, compounding ingredients, etc. National Aniline & Chemical Co., Inc., New York, N. Y.

160,933 TRENYLINE—rubber accelerators, compounding ingredients, etc. National Aniline & Chemical Co., Inc., New York, N. Y.

160,951 Representation of a swimming figure with swimming device attached around waist—swimming or bathing body-supporting floats. Regina Swimming Devices Co., New York, N. Y.

160,981 THERMATOMIC—carbon black. Thermatomic Carbon Co., Pittsburgh, Pa.

Act of March 19, 1920, Section 1 (b)

161,009 HOMCHARGER—electrical rectifiers and rheostats. The Automatic Electrical Devices Co., Cincinnati, O.

161,023 No BRISTLE—rubber brushes. The No Bristle Brush Co., Boston, Mass.

The Dominion of Canada

Registered

32,029 RAYDIO—brassières, girdles, etc. American Lady Corset Co., Detroit, Mich., U. S. A.

32,032 Red band running longitudinally of belt at one side of center line—belting. Gutta Percha & Rubber, Limited, Toronto, Ont.

32,084 PICHER—chemicals, including zinc oxide, The Eagle-Picher Lead Co., Cincinnati, Ohio, U. S. A.

32,085 Representation of an eagle on a rock, with the word EAGLE above and the word PICHER below, all within the inner of two concentric circles between which are the words THE EAGLE-PICHER LEAD COMPANY—chemicals, including zinc oxide. The Eagle-Picher Lead Co., Cincinnati, Ohio, U. S. A.

32,096 MAXFLI—golf balls. The Dunlop Rubber Co., Ltd., Dunlop House, 1 Albany street, Regents' Park, London, N.W. 1, Eng.

32,115 GLADIATOR—hoof pads. The Federal Rubber Co. of Illinois, Chicago, Ill., U. S. A.

The United Kingdom

Published October 4, 1922

B419,007 SCLEROSCOPE—instruments for determining the qualities of solid bodies, as rubber. The Shore Instrument & Manufacturing Co., Jamaica, New York, U. S. A.; address in United Kingdom, care of Lloyd Wise & Co., 10 New Court, London, W.C. 2.

424,302 "QUEST" inside a rectangle beneath representation of a vessel and an iceberg within an oval—waterproof and rainproof clothing. F. Williamson trading as Murray & Co., 31A, Great Arcoats street, Manchester, Eng.

425,041 BELDAM'S on a flag at top of a mast against background of sea and clouds, within a circle in turn within a rectangle bearing at the bottom the name of the company—asbestos, raw or partly prepared. The Beldam Packing & Rubber Co., Ltd., 29 Gracechurch street, London, E.C. 3.

425,049 BELDAM'S on a flag at top of a mast against background of sea and clouds, within a circle in turn within a rectangle bearing at the bottom the name of the company—belting and all goods included in Class No. 37. The Beldam Packing & Rubber Co., Ltd., 29 Gracechurch street, London, E.C. 3.

425,052 BELDAM'S on a flag at top of a mast against background of sea and clouds, within a circle in turn within a rectangle bearing at the bottom the name of the company—asbestos cloth, tape, rope, yarn, but not engine packing; hose and jointing included in Class No. 50, etc. The Beldam Packing & Rubber Co., Ltd., 29 Gracechurch street, London, E.C. 3.

427,019 COSMOS—wireless apparatus. Metropolitan-Vickers Electrical Co., Ltd., 4 Central Buildings, Westminster, London, S.W. 1.

428,146 GECOHMA—wireless apparatus. The General Electric Co., Ltd., Magnet House, Kingsway, London, W.C. 2.

Published October 11, 1922

424,277 BIRIBI with a black triangle with a white center resting on one point on top of each letter I—vulcanized rubber container for applying toilet preparations to the hair. Simplo Füllfeder-Gesellschaft Voss Lausen & Dziambor, Schanzenstrasse 75-77, Hamburg, Germany; address in United Kingdom, care of Cruikshank & Fairweather, 62 St. Vincent street, Glasgow.

426,003 OSMANITE and conventional representation of a wrench—steam and hydraulic packing. H. L. Mason trading as The Osman Trading Co., 40 King street, Covent Garden, London, W.C. 2.

B426,327 "GRANBY"—raincoats. H. Doffman, Doffman's Corner, 1 Abingdon street and 22 Market Square, Northampton.

426,978 RESISTIMAC—showerproof and waterproof clothing. London & Leicester Rubber Co., Ltd., 27 Gallowtree Gate, Leicester.

427,065 RADION—hard rubber and vulcanite insulating materials not included in classes other than No. 40. American Hard Rubber Co., 11 Mercer street, New York City, U. S. A.; address in United Kingdom, care of Haseltine, Lake & Co., 28 Southampton Buildings, London, W.C. 2.

B427,306 WALTON within a 10-pointed star outline—plimsolls. The New Liverpool Rubber Co., Ltd., 292 Vauxhall Road, Liverpool.

427,858 PUSSYFOOT—raincoats. J. Reuben, 13 Fernie street, Adaline street, Cheetham, Manchester.

428,422 CRUSADER—all goods included in Class No. 40. T. H. Roberts, Isbells, Reigate, Surrey.

Published October 18, 1922

424,696 POWMINCO—asbestos. F. A. Mett trading as Powhatan Mining Co., Woodlawn, Baltimore, Md., U. S. A.; address in United Kingdom, care of Newitt & Son, 121 St. Stephen's House, Westminster, London, S.W. 1.

427,082 BELDAM'S on a flag at top of a mast against background of sea and clouds, within a circle in turn within a rectangle bearing at the bottom the name of the company—engine packing included in Class No. 50. The Beldam Packing & Rubber Co., Ltd., 29 Gracechurch street, London, E.C. 3.

427,303 DREADNOUGHT—rubber bands, etc. H. A. Coombs, 10 Farringdon avenue, London, E.C. 4.

427,456 DUROLITH—tires for cycles and motor cars. The Avon India Rubber Co., Ltd., The Rubber Works, Bath Road, Melksham, Wiltshire, and 343-345 Euston Road, London, N.W. 1.

427,632 PARAFOOT in white letters against a dark background accompanied by representation of a seal bearing a pair of balances and the name and address of the company—footwear. The North British Rubber Co., Ltd., Castle Mills, Fountainbridge, Edinburgh, Scotland.

Published October 25, 1922

420,557 CUMAX SPECIALTIES arranged on two lines between the letter C inside a square obliquely placed at each end—asbestos brake linings. W. Cumner, Ajax Works, Hertford Road, Barking, Essex.

424,976 T & K below conventionalized crown, within a decorated ring—synthetic bodies composed of oils and other substances for use in manufactures as rubber substitutes. Typke & King, Ltd., Crown Chemical Works, Commonside East, Mitcham Common, Surrey.

426,567 CORD above representation of a knotted cord—tires with cord foundations. Dunlop Rubber Co., Ltd., Fort Dunlop, Holly Lane, Erdington, Birmingham, Warwickshire.

426,737 MEW within a circle—wireless apparatus. Mitchell's Electrical & Wireless, Ltd., McDermott Road, Peckham, London, S.E. 15.

427,012 RANGE FINDER BRAND and name of company on conventionalized dial—golf balls, etc. D. R. Griffiths trading as Donaldson & Co., 18 Blythswood Square, Glasgow.

427,461 PLUS-MAC—raincoats, etc. W. Wolstencroft, Dolphin street, Ardwick Green, Manchester.

427,523 SWALLOWUP—tires. E. B. Killen, 27 Queen Victoria street, London, E.C. 4.

427,809 IMPENITREAD—rubber goods not included in classes other than No. 40. The Dunlop Rubber Co., Ltd., Dunlop House, 1 Albany street, London, N.W. 1.

428,406 BANDIT—rubber and gutta percha goods included in Class No. 40. J. L. Duncan, Jr., and "Duncans," 64 Shudehill, Manchester.

428,448 BAT—electrical insulation included in Class No. 50. Lindsay & Williams, Ltd., Bennett Street Works, Bennett street, Ardwick, Manchester.

Designs

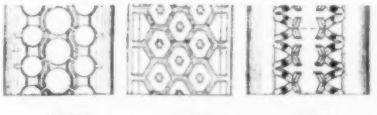
The United States

Issued* October 17, 1922

61,553 Tire tread. Term 14 years. P. Worth, Akron, assignor to The India Tire & Rubber Co., Mogadore—both in Ohio.

Issued* October 24, 1922

61,557 Tire. Term 14 years. E. H. Broadwell, Long Meadow, assignor to The Fisk Rubber Co., Chicopee Falls—both in Mass.



61,557 61,553 61,568

61,567 Tire. Term 7 years. A. Falconio, Trenton, N. J.

* Under Rule No. 167 of the United States Patent Office, the issue closes weekly on Thursday, and the patents of that issue bear date as of the fourth Tuesday thereafter.

The Dominion of Canada

Registered

5,573 Tire tread. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.
5,574 Tire tread. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.
5,575 Tire tread. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.

THE ANDERSON-OWENS SHOE CO., LYNN, MASSACHUSETTS, FITS its "Broadcast" shoe with the "Rubwedge" spring heel which has a rubber wedge inserted between the two leather lifts, welted into place by the stitching that holds the sole on.

Stevenson Plan for Rubber Control

THE proposals adopted in the Stevenson plan for rubber control published in the November issue of THE INDIA RUBBER WORLD were supplemented in the original report by an appendix of rules for the guidance of committees.

These rules govern the issuance of certificates of standard production as affected by plantation operating conditions and prior forward contracts in excess of normal standard production, and are as follows:

Suggested Rules for Committees

In issuing certificates of standard production—

(1) "Standard production" shall be the quantity of dry rubber produced from any holding during the period from November 1, 1919, to October 31, 1920, provided that if the owner of any holding is unable to declare the output from his holding during that period in the absence of proper records, or if he proves to the satisfaction of the committee that the output from his holding during that period was abnormal for any of the causes referred to in these rules, the committee shall certify some other quantity as the standard production for such holding in accordance with the rules as set out hereunder.

(2) If any owner is unable to declare the quantity of rubber produced from his holding during such period, the committee shall assess the amount to be deemed to be the standard production for that holding, but the quantities so assessed shall not exceed the quantity attained by multiplying the number of acres planted with rubber of each age by the output per acre allotted for trees of each age in accordance with the following table:

MAXIMUM OUTPUT FOR 12 MONTHS

	Pounds Per Acre
Under five years	Nil
Between five and six years	120
Between six and seven years	180
Between seven and eight years	240
Eight years and over	320

(3) If any owner claims that a portion of his holding is planted with trees which were not tapped prior to November 1, 1920, he shall be allowed as standard production in addition to his output from November 1, 1919, to October 31, 1920, an amount calculated according to the table in Rule 2 above.

(4) If any owner claims that during the period November 1, 1919, to October 31, 1920, his output was less than his normal owing to—

(a) Lack of labor;
(b) Abnormal ill health of his labor forces;
(c) Disease of his trees, from which they have since recovered;
(d) Resting of the trees; or
(e) Any other reasonable cause;

such addition shall be made to his actual output from November 1, 1919, to October 31, 1920, for purposes of certification as would, in the opinion of the committee, equal the loss of output sustained thereby, but in no such case shall the total output for the holding exceed the quantity to which he would have been entitled if he had applied under Rule 2 hereof.

(5) If any owner can prove to the satisfaction of the committee that prior to the commencement of the enactment he has entered into bona fide forward contracts for the sale and delivery of a quantity of rubber in excess of the amount of his normal "standard production" as arrived at under these rules, diminished by the percentage of restriction for the time being in force, and that either—

(a) Such contract specifies that the rubber to be delivered under the contract is rubber from his holding only; or

(b) He is unable to contract on the market to buy in the excess contracted for over the quantity he would be allowed to produce at a price not greater than the price at which he has sold, the committee may allow him as standard production such quantity as when diminished by the percentage of restriction for the time being in force would allow him to produce a sufficient quantity to cover his contracts, provided that certificates issued under this rule may be revised by the committee at any time when such contracts expire or the percentage of restriction for the time being in force is altered.

(6) Certificates of "standard production" when issued may not be varied within 12 months of the date of such issue, but on the expiration of such period of 12 months or any subsequent period of 12 months any owner may apply for revision of the quantity for which his holding has been assessed on the grounds that further areas have since the issue of the certificate attained the age of five years and are in a condition to tap. In such case the committee shall increase the quantity assessed in accordance with the rules laid down herein.

(7) If any owner states on his application form that he desires to be assessed at any quantity other than his actual output from the period of November 1, 1919, to October 31, 1920, and gives his reasons for this request, the committee shall, before issuing any certificate, notify such owner of the quantity at which the committee proposes to assess him, and inform him that in the event of his objecting to such assessment he must state his case personally or by his representative or by letter at a specified time and place.

Comparative Low and High New York Spot Rubber Prices

	November 1922*	November 1921	November 1920
PLANTATIONS			
First latex crêpe	$0.22½ @ $0.24½	$0.16 @ $0.19	$0.18½ @ $0.21½
Smoked sheet, ribbed	.22⅛ @ .24⅛	.16 @ .19	.17½ @ .20
PARAS			
Upriver, fine	.23½ @ .24½	.22 @ .24½	.20½ @ .23¾
Upriver, coarse	.17 @ .18½	.12 @ .14½	.14½ @ .15½
Islands, fine	.21 @ .22½	.20¼ @ .22½	.18½ @ .20
Islands, coarse	.12 @ .16	.09 @ .16¼	.14 @ .14½
Cametá	.09½ @ .14½	.10 @ .11½	.13 @ .14½

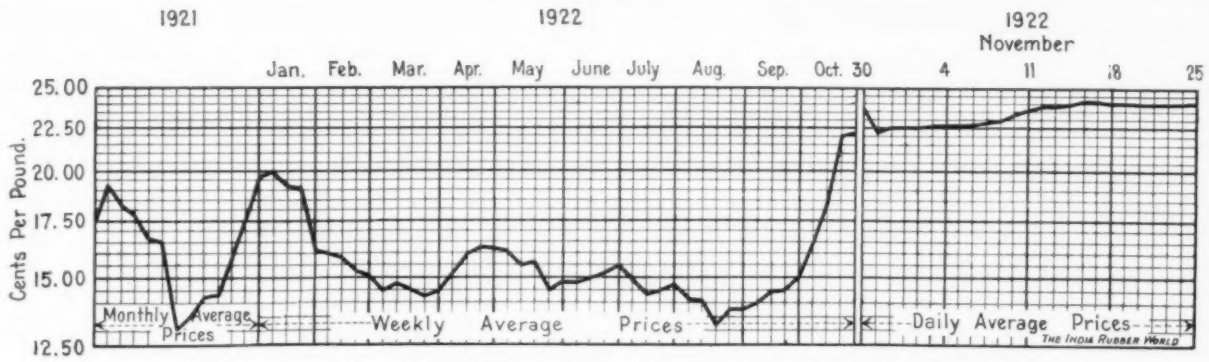
*Figured to November 23, 1922.

New York Average Spot Rubber Prices

PRICES IN CENTS PER POUND

	October, 1922																							
PLANTATIONS																								
Sheet	2	3	4	5	6	7	9	10	11	12*	13	14	16	17	18	19	20	21	23	24	25	26	27	28
Ribbed smoked	15¼	15⅛	16⅛	16¾	16⅝	16⅞	16⅞	16¾	17¼	....	19	19⅛	20¼	22⅝	22½	22	22¼	22¼	22⅝	22⅛	21⅜	21¾	21⅞	22¼
Crêpe																								
First latex	15¼	15⅛	16⅛	16⅞	16⅝	16⅞	16⅞	16¾	17¼	....	19	19⅛	20¼	22⅝	22½	22⅛	22¼	22¼	22⅝	22½	21⅞	21¾	21⅞	22¼
Off latex	15	15⅛	15⅞	16⅜	16⅛	16½	16½	16⅜	16⅞	....	18¾	19	19⅜	22	21⅝	21⅝	21½	21⅜	22⅛	21⅜	21½	21⅜	21½	21¾
No. 1 blanket	15	15¼	15¾	16⅛	16¼	16½	16⅜	16½	16¾	....	18⅝	19⅛	19⅞	21¾	21½	21¾	21⅞	21⅞	22¼	21⅞	21¾	21½	21¾	21⅞
No. 2 blanket	14¾	15	15⅛	15⅞	15⅞	16⅛	16	16⅛	16½	....	18⅜	18¾	19½	21½	21¾	21½	21⅜	21⅜	21½	21½	21⅜	21¼	21⅜	21⅝
No. 3 blanket	14⅛	14⅜	15⅛	15⅝	15½	15⅞	15⅞	15¾	16¼	....	18⅛	18½	19¼	20⅞	20¾	20⅞	20⅞	21⅛	21¼	21	21	20⅝	21	21⅜
Thin, clean, brown	14⅜	14¾	15⅛	15⅝	15⅜	16	16⅛	16½	16⅜	....	18⅛	18⅜	19⅜	21½	21	21½	21½	21⅝	21¾	21¾	21¼	20¾	21⅛	21⅜
Specky brown	14	14¼	14¼	14⅞	14⅞	15⅛	15⅜	15¼	15¾	....	17⅝	17⅝	18⅝	20½	20⅛	20¾	20⅝	20½	20¾	20⅝	20½	20⅛	20¼	20¾
Rolled brown	12⅝	13	13½	13⅜	13⅞	14⅛	14⅛	14⅜	14⅞	....	16⅜	17⅛	18⅛	19⅜	19½	20	19⅜	19¾	20¼	19⅞	19⅞	19¾	19⅞	19⅞

* Holiday.



Ratio Graph of New York Market Fluctuations—Average Prices of Ribbed Smoked Sheets

Review of the Crude Rubber Market

New York

THE market for spot ribbed smoked sheets for the past month has been very strong, advancing steadily to the 24-cent level after a drop on October 31 to 22¼ cents from 23 cents on the day before. Daily prices varied only slightly from the respective weekly averages which ran 22½, 23, 24 and 25 cents for spot ribs in sympathy with the London market.

The cabled information from the Far East early in the month that the legislatures of Ceylon and the Federated Malay States had enacted laws making effective, as of November 1, the restrictive measures of plantation output and export taxation recommended in the recent Stevenson Committee report stiffened the market position. This effect was further strengthened by the steady reduction of London stocks. The volume of New York sales the first week was not large, factories restricting their purchases to odd lots, evidently hoping for a decline to materialize.

Reference to the price graph shows that for the week ended November 4, prices were practically fixed at 22½ cents, a level that has not been reached before during a period of two years. Prices in the second and third week continued to mount fractionally day by day as stocks on both sides of the Atlantic came to be held in stronger hands and consumers began to realize that the ruling prices have come to stay. The middle two weeks of November compared with those of October show an advance of 6½ cents from 17½ in October to 24 in November. During the week ended November 25, the price held close to 24 cents with a marked rising tendency in sympathy with the Singapore and London markets. Buyers' and sellers' views drew apart. Further advance in price is predicted as factory buying becomes more active.

Nearby futures ruled only fractionally higher than the weekly averages. April-June averaged about 1 cent above spot throughout the month. Parás showed a steady slower rise in sympathy with plantation grades. Balatas were firm but neglected Pontianak, gutta siak, etc., with the remainder of the list, advanced moderately over last month's prices for the same grades.

Importations of all grades during October were 23,945 tons compared with 23,469 tons one year ago. Plantation arrivals for October were 22,386 tons compared with 21,602 tons for October one year ago. Total importations of all grades for the ten months ended October 31, were 229,600 tons as compared with 142,935 tons for the corresponding period last year.

Spot and future quotations on standard plantation and Brazilian grades were as follows:

PLANTATIONS. November 1. Spot first latex crêpe, 22¼-22½ cents; Nov.-Dec., 22⅜-22⅝ cents; Jan.-Mar., 23-23¼ cents; Apr.-June, 23½-23⅝ cents. NOVEMBER 25. Spot first latex crêpe, 24½-24¾ cents; Dec., 24⅝ cents; Jan.-Mar., 25 cents; Jan.-June, 25¼ cents; Apr.-June, 25½ cents.

NOVEMBER 1. Spot ribbed smoked sheets, 22¼-22½ cents; Nov.-Dec., 22⅜-22⅝ cents; Jan.-Mar., 23-23¼ cents; Apr.-June, 23½-23⅝ cents. NOVEMBER 25. Spot ribbed smoked sheets, 24½-24¾ cents; Dec., 24⅝ cents; Jan.-Mar., 25 cents; Jan.-June, 25¼ cents; Apr.-June, 25½ cents.

NOVEMBER 1. Spot, No. 1 amber crêpe, 22 cents; Dec., 22¼ cents; Jan.-Mar., 22½ cents. NOVEMBER 25. Spot, No. 1 amber crêpe, 24 cents; Dec., 24⅜ cents; Jan.-Mar., 24½ cents.

NOVEMBER 1. Spot, No. 1 rolled brown crêpe, 20¼ cents; Nov.-Dec., 20½ cents; Jan.-Mar., 21 cents. NOVEMBER 25. Spot, No. 1 rolled brown crêpe, 22½ cents; Dec., 22⅝ cents; Jan.-Mar., 23 cents.

SOUTH AMERICAN PARÁS AND CAUCHO. November 1. Spot, upriver fine, 23½ cents; islands fine, 20½ cents; upriver coarse, 18 cents; islands coarse, 12 cents; Cametá, 13 cents; caucho ball, 17 cents. NOVEMBER 25. Spot, upriver fine 23¾-24 cents; islands fine, 22 cents; upriver coarse, 17-17½ cents; islands coarse, 12½ cents; Cametá, 12-13 cents; caucho ball, 17¼-18 cents.

London

Ceylon and the Federated Malay States have legislated to make the recommendations of the Stevenson plan effective November 1, 1922. The market has been characterized throughout the month by noticeably steady prices scarcely varying from 12*d.* the first week, maintaining this level for the first two weeks of the month, then rising sharply to 12½*d.* due to the firmer statistical by decrease of London stocks. This price marked the high point receding to 12¼*d.*, the fourth week with undertone reported heavy. It was reported that the Russian Soviet bought 2,000 tons of rubber in the London market this month.

New York Quotations

Following are the New York spot quotations per pound, for one year, one month ago, and November 25, the current date:

Plantation Hevea	November 1, 1921	November 1, 1922	November 25, 1922
CREPE			
First latex	$0.20 @	$0.22¾ @	$0.24½ @ .24¾
Off latex	.19 @	.22½ @	.23¾ @
Amber No. 1	.19 @	.22½ @	.24 @
Amber No. 2	.18½ @	.22¼ @	.23¾ @
Amber No. 3	.18 @	.22 @	.23¼ @
Brown, thick, thin, clean	.18½ @	.22 @	.23½ @
Brown, specky	.17½ @	.21¾ @	.22¾ @
Brown, rolled	.16½ @	.21¼ @	.22½ @
SHEET			
Smoked, ribbed	.20 @	.22¾ @	.24½ @ .24¾
Smoked, plain	@	@	.23 @
Unsmoked	@	@	.22¾ @

Crude Rubber Market—*Continued*

	November 1, 1921	November 1, 1922	November 25, 1922
LIQUID LATEX			
Liquid latex	@	$1.25 @	*per gal.* $1.25
SCRAP			
Colombo scrap No. 1	†.16½ @	.17 @	.17½ @.18
Colombo scrap No. 2	†.14¾ @	.16 @	.16 @.17
East Indian			
PONTIANAK			
Banjermassin	.08¾ @	.08 @	.08 @
Pressed block	.11¾ @	.13¾ @	.13 @.15
Sarawak	.06½ @	.07½ @	.06⅝ @.06¾
South American			
PARAS			
Upriver fine	.24 @	.24½ @	.24 @
Upriver fine*	@	*.31 @	*.32½ @
Upriver medium	.21½ @	.21½ @	.21 @
Upriver coarse	@	.18 @.18½	.17 @
Upriver weak, fine	.30 @	@	@
Islands fine	.20½ @	.21 @	.22 @
Islands fine*	@	*.29 @	*.30½ @
Islands medium	.18½ @	@	.19¾ @
Islands coarse	.10½ @	.12½ @	.12½ @
Cametá	.09½ @.10½	.12½ @.13	.12 @
Cametá	@	*.21½ @	*.26 @
Acre Bolivian fine	.24 @.24½	.25 @	.24½ @
Acre Bolivian fine*	@	*.31 @	*.32½ @
Beni Bolivian	.24 @.24½	@	.24½ @
Madeira fine	.25 @.25½	@	.26 @
Peruvian fine	.22½ @.23½	@	.22½ @
Tapajos fine	.21½ @.22½	.22 @.22½	.22½ @
CAUCHO			
Upper caucho ball	.14 @	.18 @	.18 @
Upper caucho ball*	@	*.21½ @	*.27 @
Lower caucho ball	.11½ @.12½	.17 @	.17¼ @
Manicobas			
Ceará negro heads	†.12 @	†.15 @	†.20 @
Ceará scrap	†.08 @	†.09 @	†.18 @
Manicoba 30%, guaranty	.09 @	†.06 @	†.15 @
Mangabeira, thin sheet	.15 @	†.15 @	†.20 @
Centrals			
Central scrap	.13½ @.14½	.14½ @	.15 @.17½
Central scrap and strip	.13½ @.14½	.14 @	.14 @.17
Central wet sheet	.04½ @.05½	.04 @.06	.07 @.09
Corinto scrap	.13½ @.14½	.14½ @	.15½ @.17½
Esmeralda sausage	.13½ @.14½	.14½ @	@
Guayule washed and dried	.25 @.25½	.26 @	.26 @
Africans			
Benguela, No. 1, 28½%	@	@	.10 @.11
Benguela, No. 2, 32½%	@	.06 @.07	.08 @
Congo prime, black upper	@	.11 @.13	.13 @.14
Congo, prime, red upper	@	.11 @.13	.15 @
Kassai, black	@	.12 @	.12 @.13
red	@	.11 @.13	.14 @.15
Gutta Percha			
Gutta Siak	.16½ @ .17	.13½ @	.17 @
Red Macassar	2.75 @2.80	2.75 @2.80	2.80 @
Balata			
Block, Ciudad Bolivar	.58 @ .59	.59 @	.58 @.60
Colombia	.48 @.48½	.49 @	.49 @.52
Panama	.47 @.47½	.48 @	.49 @.52
Surinam sheet	.71 @.71½	.67 @	.70 @.71
amber	.74 @.74½	.72 @	.74 @.75
Chicle			
Colombia	@	.19 @.25	.25 @.30
Honduras	@	.63 @.64	.62 @
Venezuela	@	.65 @	.63 @
Yucatan fine	@	.68 @	.65 @

* Washed and dried crêpe. Shipment from Brazil.
† Nominal.

Reclaimed Rubber

The sharp upward movement in the price of crude rubber has brought to realization the hope of the reclaim manufacturers of increased demand for their product at improved prices. With the price advance has come increase of business resulting in stimulating the volume of reclaiming operations from an average of less than 50 per cent capacity to nearer 75 per cent.

Revised quotations are as follows:

New York Quotations

November 25, 1922

Prices subject to change without notice

STANDARD RECLAIMS

Floating	$0.13 @$0.14
Friction	.13 @ .14
Mechanical	.08 @ .10
Shoe, unwashed	.10 @ .11
Tires, auto	.08 @ .10
truck	.09 @ .10
White	.12½ @ .13½

Crude Rubber Arrivals at New York as Stated by Ships' Manifests

Parás and Caucho

	Fine	Medium	Coarse	Caucho	Totals Pounds
OCTOBER 20. By "Camoens," Pará and Manáos.					
Paul Bertuch	.....	.....	6,613	.....	6,613
General Rubber Co.	35,840	.....	11,200	6,720	53,760
Meyer & Brown, Inc.	¶6,720	.....	.....	.....	6,720
Poel & Kelly, Inc.	34,389	423	13,155	56,215	104,182
Schafer & Meyer	46,460	11,200	.....	33,600	91,260
Schafer & Meyer	‖11,200	.....	‖13,440	.....	§31,360
OCTOBER 20. By "Soverie," Colombo.					
Paul Bertuch	22,400	.....	.....	.....	22,400
OCTOBER 23. By "Dunstan," Pará and Manáos.					
H. A. Astlett & Co.	129,920	.....	47,040	22,400	199,360
Paul Bertuch	23,540	.....	.....	.....	23,540
General Rubber Co.	114,240	.....	8,960	8,960**	†194,880
Meyer & Brown, Inc.	¶22,400	.....	.....	40,320	62,720
Poel & Kelly, Inc.	199,116	.....	38,345	61,281	§§321,280
OCTOBER 31. By "Polycarp," Pará and Manáos.					
Paul Bertuch	61,026	.....	.....	.....	61,026
General Rubber Co.	60,480	.....	.....	.....	60,480
Meyer & Brown, Inc.	¶25,760	.....	.....	.....	25,760
Poel & Kelly, Inc.	254,543	13,296	15,680	.....	283,519
Schafer & Meyer	81,738	11,200	6,720	.....	99,658
Schafer & Meyer	‖5,600	.....	‖3,857	.....	***11,137
Ultramares Corporation	15,000	.....	.....	11,400	26,400
NOVEMBER 8. By "Santarem," Pará.					
Poel & Kelly, Inc.	86,060	.....	.....	22,300	††130,800
Schafer & Meyer	49,083	.....	.....	.....	49,083
Schafer & Meyer	‖11,200	.....	‖4,480	.....	15,680
NOVEMBER 9. By "Sheridan," Pará.					
H. A. Astlett & Co.	80,640	11,200	24,640	13,440	129,920
Meyer & Brown, Inc.	¶89,600	.....	.....	.....	89,600
Poel & Kelly, Inc.	3,640	.....	.....	.....	¶¶25,896
NOVEMBER 11. By "Denis," Pará and Manáos.					
H. A. Astlett & Co.	.....	.....	17,920	.....	17,920
Paul Bertuch	36,606	11,518	.....	.....	48,124
General Rubber Co.	253,120	.....	13,440	.....	266,560
L. Littlejohn & Co., Inc.	224,000	.....	.....	.....	224,000
Poel & Kelly, Inc.	185,000	13,510	24,800	12,600	235,910
Schafer & Meyer	2,240	.....	‖11,200	.....	13,440
Ultramares Corporation	46,300	.....	.....	.....	46,300
NOVEMBER 13. By "Southern Cross." Montevideo.					
Paul Bertuch	41,128	.....	.....	.....	41,128

¶¶Includes 22,256 lbs. of Cametá. ††Includes 22,500 lbs. of Cametá. ***Includes 1,680 lbs. of Cametá washed and dried in Brazil. §§Includes 22,538 lbs. of Cametá. **Includes 62,720 lbs. of Cametá. §Includes 6,720 lbs. of Cametá, washed and dried in Brazil. ‖Washed and dried in Brazil. †Fine and medium.

United States Crude and Waste Rubber Imports for 1922 (By Months)

	Plantations	Parás	Africans	Centrals	Guayule	Manicoba and Matto Grosso	Totals 1922	Totals 1921	Balata	Miscellaneous	Waste
January ...*tons*	20,774	916	161	16	....	....	21,867	14,177	42	126	85
February	27,270	1,347	301	14	....	41	28,973	8,641	28	448	6
March	27,711	451	326	3	154	57	28,702	14,416	17	479	61
April	13,910	462	5	2	65	....	14,444	17,269	8	122	....
May	19,485	1,072	3	....	62	....	20,622	10,732	15	855	117
June	14,851	861	14	3	....	21	15,750	13,477	12	526	23
July	24,563	575	102	2	....	3	25,245	11,692	50	541	45
August	20,462	1,175	119	8	....	....	21,764	13,974	33	640	77
September	27,899	342	47	....	....	....	28,288	15,088	48	63	58
October	22,386	957	599	3	....	....	23,945	23,469	65	71	113
Totals, 10 months, 1922...*tons*	219,311	8,158	1,677	51	281	122	229,600	.....	318	3,871	585
Totals, 10 months, 1921.....	131,748	9,402	1,646	78	58	3	.....	142,935	380	1,913	1,745

Compiled by The Rubber Association of America, Inc.

Crude Rubber Arrivals at New York as Stated by Ships' Manifests—*Continued*

Plantations

(Figured at 180 lbs. net to the bale or case.)

	Pounds	Totals
OCTOBER 20. By "Suveric," Far East.		
Baird Rubber & Trading Co., Inc.	67,200	
Poel & Kelly, Inc.	22,400	
Charles T. Wilson Co., Inc.	184,800	
L. Littlejohn & Co., Inc.	268,800	543,200
OCTOBER 20. By "Telemachus," Far East.		
H. A. Astlett & Co.	504,000	
Baird Rubber & Trading Co., Inc.	403,200	
Continental Rubber Co. of New York	56,000	
General Rubber Co.	176,800	
Hood Rubber Co.	*134,419	
J. T. Johnstone & Co., Inc.	71,511	
Meyer & Brown, Inc.	593,600	
H. Muehlstein & Co., Inc.	‡51,000	
Poel & Kelly, Inc.	387,680	
Fred Stern & Co., Inc.	290,956	
Charles T. Wilson Co., Inc.	526,400	
Various	*108,221	
L. Littlejohn & Co., Inc.	2,912,000	
Schafer & Meyer	22,400	
Various	1,266,833	8,305,020
OCTOBER 21. By "Mississippi," London		
Meyer & Brown, Inc.	47,040	
L. Littlejohn & Co., Inc.	224,000	
Various	60,160	331,200
OCTOBER 21. By "Noordam," Rotterdam.		
Fred Stern & Co., Inc.	55,246	
Various	10,094	65,340
OCTOBER 21. By "Scythia," Far East.		
Poel & Kelly, Inc.	314,488	
Various	30,392	344,880
OCTOBER 23. By "Kroonland," Antwerp.		
Various	323,620	323,620
OCTOBER 25. By "Hague Maru," Far East.		
H. A. Astlett & Co.	44,800	
M. Muehlstein & Co., Inc.	56,000	
Poel & Kelly, Inc.	1,289,790	
Fred Stern & Co., Inc.	16,800	
L. Littlejohn & Co., Inc.	716,800	
Schafer & Meyer	453,130	
Various	78,400	2,655,720
OCTOBER 27. By "Menominee," London.		
Hood Rubber Co.	*936	
Aldens' Successors, Inc.	66,483	67,419
OCTOBER 27. By "Elveric," Far East.		
J. T. Johnstone & Co., Inc.	49,388	
L. Littlejohn & Co., Inc.	369,600	
Poel & Kelly, Inc.	123,270	
Fred Stern & Co., Inc.	31,360	
Charles T. Wilson Co., Inc.	156,800	
Various	*54,000	
Various	120,982	959,040
OCTOBER 27. By "Moorish Prince," Far East.		
H. A. Astlett & Co.	459,000	
General Rubber Co.	100,800	
J. T. Johnstone & Co., Inc.	13,532	
Meyer & Brown, Inc.	145,600	
H. Muehlstein & Co., Inc.	134,400	
Poel & Kelly, Inc.	*112,000	
Fred Stern & Co., Inc.	22,400	
Charles T. Wilson Co., Inc.	134,400	
Meyer & Brown, Inc.	246,900	
L. Littlejohn & Co., Inc.	1,344,000	
Schafer & Meyer	33,600	
Various	1,585,108	4,331,740
OCTOBER 28. By "Colon," Cristobal.		
Various	2,340	2,340
OCTOBER 28. By "Robert Dollar," Far East.		
H. A. Astlett & Co.	280,000	
Baird Rubber & Trading Co., Inc.	56,000	
Adolph Hirsch & Co., Inc.	22,400	
Hood Rubber Co.	*67,400	
J. T. Johnstone & Co. Inc.	590,410	
Meyer & Brown, Inc.	179,200	
Poel & Kelly, Inc.	†449,000	
Poel & Kelly, Inc.	*89,600	
Fred Stern & Co., Inc.	130,988	
Charles T. Wilson Co., Inc.	100,800	
Poel & Kelly, Inc.	138,264	
L. Littlejohn & Co., Inc.	1,792,000	
Schafer & Meyer	4,480	
Various	4,349,518	8,250,060
OCTOBER 28. By "Verentia," Far East.		
General Rubber Co.	875,840	
Poel & Kelly, Inc.	1,430,118	
L. Littlejohn & Co., Inc.	224,000	
Various	447,602	2,977,560
OCTOBER 29. By "Tyrrhenia," Far East.		
Poel & Kelly, Inc.	294,700	294,700
OCTOBER 30. By "City of Westminster," Far East.		
H. A. Astlett & Co.	112,000	
General Rubber Co.	67,200	
Hood Rubber Co.	*10,200	
L. Littlejohn & Co., Inc.	560,000	
H. Muehlstein & Co., Inc.	56,000	
Poel & Kelly, Inc.	100,750	
Charles T. Wilson Co., Inc.	168,000	
Various	*1,500	1,492,020
OCTOBER 31. By "President Van Buren," London.		
Various	56,160	56,160
NOVEMBER 1. By "Carmania," Far East.		
Poel & Kelly, Inc.	120,975	
Various	19,685	140,660
NOVEMBER 1. By "Mauretania," London.		
Various	4,140	4,140
NOVEMBER 2. By "Bear Port," Far East.		
L. Littlejohn & Co., Inc.	‡33,600	
Poel & Kelly, Inc.	‡100,800	134,400
NOVEMBER 4. By "West Camak," Bahia.		
Various	18,000	18,000
NOVEMBER 4. By "Ryndam," Far East.		
L. Littlejohn & Co., Inc.	459,200	
Charles T. Wilson Co., Inc.	68,320	
Various	49,380	576,900
NOVEMBER 5. By "Mesaba," London.		
Aldens' Successors, Inc.	22,525	
L. Littlejohn & Co., Inc.	22,400	
Various	251,175	296,100
NOVEMBER 6. By "Vardulia," Far East.		
L. Littlejohn & Co., Inc.	179,200	
Poel & Kelly, Inc.	1,315,864	
Various	133,216	1,628,280
NOVEMBER 7. By "Gothland," Antwerp.		
H. Muehlstein & Co., Inc.	22,400	
Various	7,300	29,700
NOVEMBER 7. By "Nile," Far East.		
Poel & Kelly, Inc.	22,400	
Fred Stern & Co., Inc.	11,200	33,600
NOVEMBER 10. By "Half Moon," Far East.		
H. A. Astlett & Co.	123,200	
General Rubber Co.	222,040	
L. Littlejohn & Co., Inc.	1,120,000	
Meyer & Brown, Inc.	56,000	
H. Muehlstein & Co., Inc.	392,000	
Poel & Kelly, Inc.	560,641	
Fred Stern & Co., Inc.	219,900	
Charles T. Wilson Co., Inc.	392,000	
Various	906,359	3,964,140
NOVEMBER 11. By "Newby Hall," Far East.		
General Rubber Co.	448,000	
L. Littlejohn & Co., Inc.	486,080	
Meyer & Brown, Inc.	134,400	
H. Muehlstein & Co., Inc.	6,700	
Poel & Kelly, Inc.	88,818	
Fred Stern & Co., Inc.	129,900	
Charles T. Wilson Co., Inc.	89,600	
Various	243,142	1,608,660
NOVEMBER 11. By "Egremont Castle," Far East.		
H. A. Astlett & Co.	78,400	
Baird Rubber & Trading Co., Inc.	112,000	
General Rubber Co.	1,398,000	
Hood Rubber Co.	*11,200	
J. T. Johnstone & Co., Inc.	12,367	
L. Littlejohn & Co., Inc.	2,240,000	
Meyer & Brown, Inc.	56,000	
H. Muehlstein & Co., Inc.	*50,000	
Poel & Kelly, Inc.	540,990	
Fred Stern & Co., Inc.	128,800	
Charles T. Wilson Co., Inc.	246,400	
H. Muehlstein & Co., Inc.	89,600	
Various	*24,300	4,988,057
NOVEMBER 12. By "France," Havre.		
Various	540	540
NOVEMBER 13. By "City of Bagdad," Far East.		
H. A. Astlett & Co.	464,800	
Baird Rubber & Trading Co., Inc.	268,800	
Continental Rubber Co. of New York	22,400	
General Rubber Co.	300,400	
J. T. Johnstone & Co., Inc.	123,200	
L. Littlejohn & Co., Inc.	1,910,720	
Meyer & Brown, Inc.	627,200	
H. Muehlstein & Co., Inc.	6,720	
Poel & Kelly, Inc.	851,936	
Fred Stern & Co., Inc.	255,500	
Charles T. Wilson Co., Inc.	314,720	
Various	*36,000	
Various	2,069,624	7,252,020
NOVEMBER 13. By "Samaria," Far East.		
Poel & Kelly, Inc.	33,115	
General Rubber Co.	80,640	113,755
NOVEMBER 13. By "Harold Dollar," Far East.		
Charles T. Wilson Co., Inc.	‡116,480	
Fred Stern & Co., Inc.	‡44,800	161,280
NOVEMBER 15. By "Volendam," Far East.		
L. Littlejohn & Co., Inc.	112,000	
Fred Stern & Co., Inc.	56,000	
Charles T. Wilson Co., Inc.	41,840	209,840
NOVEMBER 15. By "Vasconia," Far East.		
General Rubber Co.	378,560	
Poel & Kelly, Inc.	2,116,606	2,495,166
NOVEMBER 17. By "Laconia," Far East.		
Poel & Kelly, Inc.	54,689	54,689
NOVEMBER 18. By "Malacca Maru," Colombo.		
L. Littlejohn & Co., Inc.	280,000	280,000
NOVEMBER 18. By "Titan," Far East.		
J. T. Johnstone & Co., Inc.	280,596	
General Rubber Co.	655,590	
L. Littlejohn & Co., Inc.	2,168,320	
Hood Rubber Co.	‡22,355	3,126,861
NOVEMBER 20. By "City of Norwich," Far East.		
Hood Rubber Co.	*27,480	
L. Littlejohn & Co., Inc.	672,000	749,480
NOVEMBER 20. By "Salawati," Far East.		
General Rubber Co.	504,100	
L. Littlejohn & Co., Inc.	1,153,600	1,657,700

*Arrived at Boston. †Arrived at Baltimore. ‡Arrived at San Francisco.

Rubber Latex

NOVEMBER 10. By "Half Moon," Belawan.		
Various	16,000 gal.	
NOVEMBER 11. By "Egremont Castle," Belawan.		
Various	16,000 gal.	
Various	138,772 lbs.	
Various	5 bbls.	
NOVEMBER 13. By "City of Bagdad," Penang.		
Various	30 cases	

Africans

	Pounds	Totals
OCTOBER 15. By "Zeeland," Antwerp.		
Various	33,030	33,030
OCTOBER 28. By "Lapland," Antwerp.		
Various	198,630	198,630
OCTOBER 30. By "Cedric," Liverpool.		
Fred Stern & Co., Inc.	34,018	34,018

Centrals

OCTOBER 24. By "Alvarado," Guayaquil.		
Various	3,000	3,000
NOVEMBER 5. By "Southern Cross," Montevideo.		
Paul Bertuch	47,400	
Robert Badenhop	1,200	
Various	14,850	63,450

Pontianak

OCTOBER 20. By "Telemachus," Singapore.		
Various	93,900	93,900
OCTOBER 27. By "Moorish Prince," Singapore.		
Various	10,800	10,800
NOVEMBER 11. By "Egremont Castle," Singapore.		
L. Littlejohn & Co., Inc.	135,000	
Various	31,500	166,500
NOVEMBER 13. By "City of Bagdad," Singapore.		
L. Littlejohn & Co., Inc.	23,000	
Various	63,900	96,900
NOVEMBER 20. By "Salawati," Java.		
L. Littlejohn & Co., Inc.	112,000	112,000

Gutta Siak

OCTOBER 27. By "Moorish Prince," Singapore.		
L. Littlejohn & Co., Inc.	56,000	56,000
OCTOBER 28. By "Robert Dollar," Singapore.		
Fred Stern & Co., Inc.	11,200	
Various	22,400	33,600
NOVEMBER 10. By "Half Moon," Singapore.		
Fred Stern & Co., Inc.	11,200	
Various	5,600	16,800
NOVEMBER 11. By "Egremont Castle," Singapore.		
L. Littlejohn & Co., Inc.	56,000	
Various	8,800	64,800
NOVEMBER 13. By "City of Bagdad," Singapore.		
L. Littlejohn & Co., Inc.	56,000	56,000

Gutta Percha

OCTOBER 27. By "Moorish Prince," Singapore.		
Various	64,800	64,800
NOVEMBER 12. By "Badogry," Dakar.		
Various	8,400	8,400
NOVEMBER 20. By "Salawati," Java.		
L. Littlejohn & Co., Inc.	56,000	56,000

Balata

October 15. By "Paria," Paramaribo.		
Various	4,350	4,350
OCTOBER 19. By "Carrillo," Pt. Colombo.		
Various	3,600	3,600
OCTOBER 23. By "Dunstan," Brazil.		
L. Littlejohn & Co., Inc.	4,400	4,400
OCTOBER 26. By "Tivives," Cartagena.		
Various	1,950	1,950
OCTOBER 26. By "Mayaro," Trinidad.		
Middleton & Co., Ltd.	1,226	
Various	14,374	15,600
OCTOBER 29. By "William Tupper," French Guiana.		
Middleton & Co., Ltd.	34,657	
Various	593	35,250
OCTOBER 31. By "Montpelier," Hamburg.		
Ultramares Corporation	26,400	26,400
NOVEMBER 1. By "Metapan," Colombia.		
Various	2,550	2,550
NOVEMBER 1. By "Prins Frederick Hendrick," Paramaribo.		
Various	3,750	3,750
NOVEMBER 1. By "Pastores," Cristobal.		
Various	1,050	1,050
NOVEMBER 1. By "Polycarp," Pará.		
H. A. Astlett & Co.	44,800	
Ultramares Corporation	4,100	48,900
NOVEMBER 8. By "Maraval," Trinidad.		
Middleton & Co., Ltd.	17,256	
Various	2,244	19,500
NOVEMBER 12. By "Surinam," Paramaribo.		
Various	5,100	5,100
NOVEMBER 12. By "Denis," Brazil.		
L. Littlejohn & Co., Inc.	47,000	47,000
NOVEMBER 13. By "Samaria," Liverpool.		
Various	12,450	12,450

Exports of India Rubber Manufactures from the

EXPORTED TO—	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed and Auto Cloth and Auto Topping Value
EUROPE													
Azores and Madeira Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Austria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Belgium	$1,333	$1,679	.....	$992	984	$3,121	2,556	$2,093	.....	.....	.....	$4,630	$2,337
Bulgaria	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Denmark	703	56	$596	.....	.....	.....	6,210	5,510	.....	.....	$39	2,213	448
Esthonia	.....	.....	.....	.....	.....	.....	75,000	16,000	.....	.....	.....	.....	.....
Finland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,422	131
France	762	201	111	15,135	.....	.....	315	476	.....	.....	60	63,907	364
Germany	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gibraltar	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	253	.....
Greece	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hungary	1,380	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Iceland and Faroe Islands	.....	182	.....	.....	4,267	11,959	400	484	.....	.....	290	73	64
Italy	243	.....	.....	651	.....	.....	778	262	.....	.....	15	6,323	257
Jugoslavia, Albania, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Latvia	.....	77	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Malta, Gozo, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Netherlands	3,028	15	158	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Norway	546	40	141	.....	20	78	15,691	11,525	240	$123	21	378	230
Poland and Danzig	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portugal	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,081	116
Rumania	.....	.....	500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Russia in Europe	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spain	.....	.....	107	3,638	.....	.....	6,717	4,173	.....	.....	155	3,825	513
Sweden	4,045	460	.....	1,030	48	89	.....	.....	.....	.....	.....	16,275	110
Switzerland	370	.....	.....	312	.....	.....	16,449	15,063	.....	.....	59	1,200	.....
Turkey in Europe	.....	.....	.....	.....	.....	.....	25,700	23,479	.....	.....	3	.....	.....
England	7,733	13,377	4,327	66,036	7,315	15,484	9,020	7,517	4,732	4,591	1,044	6,662	13,644
Scotland	.....	252	.....	.....	1,107	1,834	6,677	4,107	.....	.....	10	3,938	.....
Ireland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, EUROPE	$20,143	$16,339	$5,940	$87,794	12,741	$32,565	165,513	$90,719	4,972	$4,714	$1,696	$112,180	$18,214
NORTH AMERICA													
Canada—Maritime Provinces	$24	$214	.....	.....	576	$1,950	19	$78	16	$18	.....	$20	$13
Quebec and Ontario	6,904	11,080	$4,218	$5,861	563	1,295	521	1,065	50	42	$297	11,531	9,118
Prairie Provinces	911	189	69	.....	.....	.....	623	762	48	64	.....	1,094	272
Brit. Columbia and Yukon	4,984	1,497	635	.....	736	2,640	1,510	898	.....	.....	.....	665	503
British Honduras	29	.....	.....	.....	.....	.....	.....	.....	383	374	18	10	.....
Costa Rica	328	363	.....	.....	.....	.....	.....	.....	.....	.....	384	.....	.....
Guatemala	1,316	143	135	.....	.....	.....	.....	.....	927	780	.....	.....	.....
Honduras	36	394	110	.....	.....	.....	408	264	1,239	1,100	271	.....	.....
Nicaragua	160	145	293	.....	.....	.....	.....	.....	476	372	1,534	.....	106
Panama	.....	207	342	.....	12	36	552	233	2,267	2,049	688	336	241
Salvador	.....	129	152	95	.....	.....	.....	.....	378	230	2,256	437	324
Greenland	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,945	.....	.....
Mexico	8,804	8,768	10,097	.....	19	105	73	101	4,173	3,961	15,867	5,343	1,176
Miquelon and St. Pierre Islands	.....	.....	.....	.....	504	1,463	144	98	.....	.....	.....	.....	.....
Newfoundland and Labrador	.....	287	.....	.....	937	2,376	3,349	2,952	48	27	1,010	32	53
Bermuda	.....	127	.....	.....	16	58	4	3	208	238	142	.....	6
Barbados	.....	122	.....	.....	.....	.....	.....	.....	682	711	.....	.....	303
Jamaica	.....	159	.....	.....	.....	.....	.....	.....	1,823	1,769	179	307	502
Trinidad and Tobago	82	573	696	.....	.....	.....	48	24	592	463	65	280	579
Other British West Indies	950	115	108	.....	.....	.....	1,038	911	2,575	2,299	.....	.....	141
Cuba	2,373	10,264	10,384	.....	.....	.....	.....	.....	40,909	28,124	10,156	5,225	5,411
Dominican Republic	195	424	1,573	.....	.....	.....	48	94	724	727	204	285	634
Dutch West Indies	26	.....	114	.....	.....	.....	.....	.....	4,856	3,404	226	65	.....
French West Indies	.....	.....	.....	.....	.....	.....	.....	.....	48	58	.....	.....	824
Haiti	111	15	.....	.....	.....	.....	.....	.....	72	93	.....	210	213
Virgin Islands of United States	.....	260	.....	.....	.....	.....	36	38	480	471	173	.....	.....
TOTALS, NORTH AMERICA	$27,233	$35,415	$28,926	$5,956	3,363	$10,423	8,373	$7,521	62,974	$47,374	$35,415	$25,840	$20,419
SOUTH AMERICA													
Argentina	$6,179	$3,675	$1,268	.....	96	$200	1,293	$952	86,610	$72,632	$8,609	$5,341	$10,890
Bolivia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Brazil	5,854	3,715	1,431	$405	90	279	.....	.....	456	638	697	1,068	5,960
Chile	2,997	7,319	192	.....	.....	.....	.....	.....	840	897	.....	2,983	817
Colombia	825	5,710	174	.....	.....	.....	341	112	452	409	4,337	183	271
Ecuador	.....	156	.....	.....	.....	.....	.....	.....	.....	.....	141	.....	.....
British Guiana	.....	.....	55	.....	.....	.....	.....	.....	1,903	1,585	.....	65	.....
Dutch Guiana	.....	23	.....	.....	.....	.....	.....	.....	208	195	25	.....	.....
French Guiana	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Paraguay	.....	.....	.....	.....	36	162	.....	.....	120	301	.....	364	287
Peru	.....	666	1,209	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Uruguay	.....	1,405	304	.....	.....	.....	60	66	7,944	5,989	705	.....	.....
Venezuela	341	1,378	2,457	.....	.....	.....	711	518	.....	.....	1,382	761	565
TOTALS, SOUTH AMERICA	$16,096	$24,047	$7,090	$405	222	$632	2,405	$1,648	98,533	$82,646	$15,896	$10,765	$18,790
ASIA													
Aden	.....	.....	.....	.....	.....	.....	.....	.....	1,141	$1,032	.....	$8,077	$36
British India	$258	$1,353	$264	.....	.....	.....	.....	.....	.....	.....	.....	.....	89
Ceylon	.....	.....	.....	.....	.....	.....	.....	.....	684	495	.....	66	.....
Straits Settlements	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other British East Indies	.....	.....	.....	.....	.....	.....	276	$258	.....	.....	$118	636	1,949
China	1,250	323	540	.....	.....	.....	.....	.....	57	38	.....	186	.....
Java and Madura	.....	1,321	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other Dutch East Indies	.....	.....	265	.....	.....	.....	.....	.....	288	354	.....	.....	.....
French Indo-China	2,691	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Hejaz, Arabia, etc.	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	75	75
Hongkong	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Japan	1,746	1,719	5,547	$4,970	3,657	$8,383	14,582	13,993	672	520	.....	2,471	.....
Kwangtung	.....	.....	.....	.....	.....	.....	4,433	3,230	.....	.....	.....	.....	770
Palestine and Syria	.....	.....	.....	.....	.....	.....	24	39	.....	.....	.....	.....	.....
Siam	.....	.....	.....	.....	.....	.....	369	315	.....	.....	.....	.....	.....
Turkey in Asia	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
TOTALS, ASIA	$5,945	$4,716	$6,616	$4,970	3,657	$8,383	19,675	$17,844	2,842	$2,439	$118	$11,511	$2,919

United States by Countries During September, 1922

Water-proofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Tire Repair Materials Value	Druggists' Rubber Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	All Other Rubber Manufactures Value	Totals Value
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	$45	$45
.....	100	$1,587	.....	.....	.....	100	$100	.....	.....	.....	.....	.....	.....	.....	1,687
.....	861	13,633	$25	.....	.....	539	1,048	$20	$328	$431	.....	.....	.....	7,220	38,890
.....	25	180	.....	.....	.....	114	255	.....	.....	.....	.....	.....	.....	.....	435
.....	656	7,523	501	$898	.....	325	633	230	946	565	.....	.....	.....	180	21,041
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16,000
.....	57	1,467	.....	178	.....	42	100	.....	.....	.....	.....	.....	.....	.....	3,298
.....	5,465	52,552	9	.....	.....	50	85	.....	.....	2,964	.....	.....	$4,127	14,009	154,762
.....	4	106	.....	.....	.....	602	1,202	.....	.....	.....	.....	.....	.....	.....	1,308
.....	14	351	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	351
.....	240	3,323	.....	720	.....	140	186	.....	.....	.....	.....	.....	.....	.....	4,482
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,380
$122	117	1,517	.....	.....	.....	110	159	.....	50	.....	.....	.....	.....	.....	14,900
1,163	191	2,979	.....	.....	.....	60	111	.....	315	1,905	.....	.....	.....	5,963	20,217
.....	304	6,772	.....	.....	.....	278	687	.....	.....	.....	.....	.....	.....	.....	7,459
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	77
.....	98	1,036	.....	.....	.....	168	347	16	.....	.....	.....	.....	.....	71	1,470
.....	768	14,931	2,101	128	.....	1,074	2,283	593	80	60	.....	.....	.....	505	23,902
.....	436	8,368	.....	1,122	$10	517	1,069	4	375	.....	.....	.....	.....	439	24,469
.....	262	4,152	.....	.....	.....	280	509	.....	.....	.....	.....	.....	.....	.....	4,661
.....	931	12,472	204	2,795	.....	424	783	76	.....	481	.....	.....	.....	83	18,091
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	142	.....	.....	.....	.....	642
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15	15
.....	898	18,575	144	3,450	.....	1,586	3,737	.....	543	751	.....	.....	.....	4,020	43,631
.....	2,670	41,860	1,132	1,457	.....	2,409	5,523	480	41	478	.....	.....	.....	365	73,315
.....	204	2,220	.....	.....	.....	140	231	.....	.....	.....	.....	.....	.....	254	19,709
.....	365	3,283	.....	.....	.....	130	168	.....	.....	.....	.....	.....	.....	.....	27,033
25	24,945	208,139	213	11,696	.....	13,365	21,235	150	1,601	15,376	.....	.....	20,468	44,115	463,433
883	191	1,811	.....	.....	.....	35	33	.....	.....	710	.....	.....	.....	114	13,692
.....	595	5,080	.....	.....	.....	575	786	.....	.....	.....	.....	.....	.....	.....	5,866
$2,193	40,397	$414,017	$4,299	$22,444	$10	23,063	$41,270	$1,569	$4,279	$22,883	.....	.....	$24,595	$77,398	$1,006,261
$64	62	$780	.....	.....	.....	41	$65	.....	$256	$340	$38	.....	$219	$1,032	$5,111
1,136	1,988	31,089	$60	$9,476	$784	1,949	3,766	$577	6,885	7,560	3,176	$1,204	10,021	52,854	180,499
120	181	2,118	.....	234	.....	532	1,429	35	54	1,550	165	.....	.....	2,623	11,669
247	333	5,041	70	789	.....	342	564	18	184	300	.....	148	217	1,323	20,723
18	.....	.....	.....	.....	.....	.....	.....	.....	.....	10	.....	.....	.....	67	526
469	24	549	18	371	.....	34	71	6	6	49	.....	.....	.....	56	2,670
.....	187	3,919	.....	.....	.....	104	256	.....	.....	7	.....	.....	.....	158	6,714
228	71	2,006	102	728	.....	80	158	50	.....	102	.....	.....	21	79	5,649
.....	35	686	33	.....	22	52	134	2	.....	134	.....	.....	.....	102	3,723
747	358	5,948	364	788	.....	558	995	147	26	632	.....	30	96	569	14,474
.....	32	868	.....	84	.....	57	128	.....	86	.....	.....	.....	.....	2	4,791
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,945
2,083	6,474	76,683	764	3,751	1,105	5,237	11,071	228	622	2,102	.....	113	1,101	9,282	163,127
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,561
1,668	97	1,555	.....	.....	.....	258	430	.....	.....	149	.....	25	.....	775	11,339
186	.....	.....	.....	.....	.....	.....	.....	.....	.....	23	.....	.....	.....	97	880
.....	153	2,017	.....	63	.....	47	99	6	.....	.....	.....	.....	12	37	3,370
272	553	13,024	157	1,502	.....	412	386	.....	.....	174	.....	.....	.....	520	18,951
.....	424	4,839	.....	327	130	85	226	5	160	.....	.....	.....	.....	619	9,068
26	187	1,613	409	.....	102	185	332	58	.....	.....	.....	360	.....	42	7,466
5,650	11,634	120,580	827	28,063	2,619	7,792	12,251	580	1,589	3,556	.....	903	320	9,794	258,669
307	988	13,866	461	1,654	200	1,284	3,011	83	.....	.....	.....	.....	189	239	24,146
.....	101	1,093	55	.....	.....	119	223	8	.....	.....	.....	.....	.....	27	5,241
.....	342	3,666	.....	57	.....	234	373	.....	.....	.....	.....	.....	.....	.....	4,978
30	240	3,083	24	.....	115	340	557	7	49	.....	.....	.....	.....	.....	4,507
.....	51	587	.....	.....	.....	182	365	.....	115	44	.....	.....	.....	.....	1,993
$13,251	24,515	$295,610	$3,344	$47,887	$5,077	19,834	$36,890	$1,790	$10,032	$16,732	$3,379	$2,783	$12,196	$80,297	$773,790
.....	7,581	$88,591	.....	$1,638	$1,111	7,909	$11,264	$15	$1,675	$3,691	.....	.....	$240	$11,259	$229,230
.....	236	4,974	.....	.....	.....	172	404	.....	.....	.....	.....	$22	.....	.....	5,400
$5,850	6,083	59,797	$83	2,134	240	4,282	5,725	26	269	478	.....	.....	737	2,211	97,580
.....	1,955	30,271	.....	.....	3,511	1,556	3,229	.....	526	180	.....	.....	125	1,000	54,047
.....	493	7,442	30	534	295	536	1,131	.....	126	84	.....	49	85	1,176	22,973
.....	94	1,520	.....	.....	.....	38	96	.....	.....	27	.....	.....	.....	671	2,611
.....	315	3,363	.....	.....	.....	225	368	.....	.....	.....	.....	.....	.....	10	5,446
.....	20	284	.....	.....	.....	20	73	.....	.....	.....	.....	.....	.....	5	605
.....	4	77	.....	.....	.....	2	3	.....	.....	.....	.....	.....	.....	.....	80
2,613	130	1,092	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4,819
.....	824	12,797	.....	1,235	.....	512	1,043	.....	153	.....	.....	73	75	1,036	18,287
49	252	3,710	.....	.....	.....	580	747	.....	500	.....	.....	.....	.....	404	13,879
.....	963	11,815	204	355	.....	1,545	2,745	.....	94	733	.....	.....	1,458	1,037	25,743
$8,512	18,950	$225,733	$317	$5,896	$5,157	17,377	$26,828	$41	$3,343	$5,193	.....	$144	$2,720	$18,809	$480,708
.....	250	$2,164	.....	.....	.....	165	$213	.....	.....	.....	.....	.....	.....	.....	$2,377
.....	363	4,530	$9	$1,977	$88	278	488	$135	$12	$276	$73	.....	.....	$625	19,233
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	89
.....	155	1,819	.....	.....	.....	115	206	.....	.....	20	.....	.....	.....	111	2,717
.....	.....	.....	.....	.....	.....	100	160	.....	.....	.....	.....	.....	.....	1,947	2,107
.....	140	2,076	.....	.....	.....	235	357	.....	.....	2,660	.....	.....	.....	148	10,315
.....	103	1,388	.....	4,146	.....	350	572	50	.....	.....	.....	.....	.....	7	7,708
.....	169	1,543	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,808
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,045
.....	270	2,598	.....	.....	.....	220	412	.....	.....	.....	.....	.....	.....	.....	3,010
$256	.....	.....	.....	.....	.....	.....	.....	.....	.....	376	.....	.....	.....	.....	782
465	369	5,956	.....	7,571	.....	56	163	.....	925	1,669	.....	.....	$2,000	4,694	62,792
.....	1	30	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	30
2,430	2,303	28,414	.....	.....	.....	1,552	3,036	.....	466	.....	.....	.....	.....	234	38,589
.....	29	199	.....	.....	.....	.....	.....	.....	.....	145	.....	.....	.....	16	399
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	315
$3,151	4,143	$50,717	$9	$13,694	$88	3,071	$5,607	$185	$1,403	$5,146	$73	.....	$2,000	$7,782	$155,316

Exports of India Rubber Manufactures from the United

	Belting Value	Hose Value	Packing Value	Thread Value	Boots Pairs	Boots Value	Shoes Pairs	Shoes Value	Canvas Shoes with Rubber Soles Pairs	Canvas Shoes with Rubber Soles Value	Soles and Heels Value	Leather Cloth or Artificial Leather Value	Waterproofed and Auto Cloth and Auto Topping Value
OCEANIA													
Philippine Islands	$3,282	$4,375	$2,268	.....	.....	.....	.....	.....	11,736	$7,225	$6,004	$885	$1,305
Australia	1,383	1,676	1,827	.....	.....	.....	62	$51	4,728	3,460	.....	7,092	5,635
British Oceania	.....	.....	.....	.....	.....	.....	.....	.....	108	158	.....	.....	.....
French Oceania	.....	49	.....	.....	.....	.....	123	161	966	1,088	.....	.....	.....
New Zealand	915	1,531	498	.....	374	$1,176	.....	.....	476	346	.....	.....	1,153
Other Oceania	.....	.....	.....	.....	.....	.....	.....	.....	401	555	.....	.....	.....
TOTALS, OCEANIA	$5,580	$7,631	$4,593	.....	374	$1,176	185	$212	18,415	$12,832	$6,004	$7,977	$8,093
AFRICA													
British West Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
British South Africa	$36,810	$17,117	$3,188	.....	702	$1,757	81	$79	2,191	$2,346	$2,282	$5,087	$6,044
British East Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	285	225
Canary Islands	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Egypt	.....	96	.....	.....	.....	.....	.....	.....	.....	.....	58	102	181
Algeria and Tunis	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other French Africa	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Portuguese East Africa	146	45	236	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Spanish Africa	.....	.....	89	.....	.....	.....	.....	.....	.....	.....	.....	.....	437
Morocco	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	154
TOTALS, AFRICA	$36,956	$17,258	$3,513	.....	702	$1,757	81	$79	2,191	$2,346	$2,340	$5,474	$7,041
GRAND TOTALS	$111,953	$105,406	$56,678	$99,125	22,059	$54,936	196,232	$118,023	189,927	$152,351	$61,469	$173,747	$75,476

Compiled by the Bureau of Foreign Commerce, Department of Commerce, Washington, D. C.

Official India Rubber Statistics for the United States

Imports of Crude and Manufactured Rubber

	August, 1921 Pounds	August, 1921 Value	August, 1922 Pounds	August, 1922 Value
UNMANUFACTURED—*free*				
India rubber				
From Netherlands	3,137,203	$519,517	1,704,488	$325,228
Portugal	42,864	8,672	.....	.....
United Kingdom	3,564,980	504,225	3,338,800	505,723
Canada	200	57	.....	.....
Mexico	.....	.....	23,785	1,427
Brazil	1,339,406	122,834	1,941,934	218,575
Peru	.....	.....	21,815	3,407
Other South America	7,298	2,199	6,166	1,345
British East Indies	22,059,725	3,251,296	36,119,018	5,116,396
Dutch East Indies	2,371,990	449,178	10,840,890	1,660,002
Other countries	580,138	80,060	335,379	52,409
Totals	33,103,804	$4,938,038	54,332,275	$7,884,512
Balata	88,171	58,399	209,173	135,965
Jelutong (Pontianak)	324,221	17,061	595,663	38,444
Gutta percha	468,450	70,609	187,448	26,439
Guayule	.....	.....	.....	.....
Rubber scrap	302,169	14,522	253,869	7,702
Totals, unmanufactured	34,286,815	$5,098,629	55,578,428	$8,093,062
Chicle ..... *dutiable*	283,999	$142,134	422,636	$220,356
MANUFACTURED—*dutiable*				
India rubber and gutta percha	.....	$67,273	.....	$106,787
India rubber substitutes	.....	.....	100	63

Exports of Domestic Merchandise

MANUFACTURED				
India rubber				
Reclaimed	132,791	$16,360	183,988	$18,600
Scrap and old	756,204	36,569	462,271	21,134
Footwear				
Boots[1] ..... *pairs*	22,240	52,168	19,716	48,521
Shoes[1] ..... *pairs*	175,250	184,279	79,368	67,451
Canvas shoes with rubber soles[1] ..... *pairs*	.....	.....	297,407	243,236
Druggists' rubber sundries[1]	.....	49,995	52,229	58,282
Hard rubber goods				
Battery jars and accessories[1]	.....	.....	33,129	15,405
Other electrical supplies[1]	.....	.....	18,046	6,921
Other hard rubber goods[1]	.....	.....	23,434	26,678
Tires				
Pneumatic casings				
For automobiles[1]	.....	992,123	104,835	1,292,926
Other[1]	.....	.....	4,038	17,954
Pneumatic tubes				
For automobiles[1]	.....	114,074	97,469	172,834
Other[1]	.....	.....	3,350	3,766
Solid tires				
For automobile and motor trucks[1]	.....	113,108	4,901	131,019
Other[1]	.....	.....	68,453	16,489
All other tires[1]	.....	22,214	.....	.....
Tire repair materials[1]	.....	.....	104,071	36,508
Belting[1]	.....	80,358	212,462	105,332
Hose[1]	.....	108,117	297,828	113,169
Packing[1]	.....	35,233	99,923	54,428
Soles and heels[1]	.....	27,550	148,516	56,950
Thread[1]	.....	.....	91,894	105,667
Other rubber manufactures[1]	.....	325,943	325,223	175,658
Totals, manufactured	.....	$2,158,291	.....	$2,788,928

Exports of Foreign Merchandise

	August, 1921 Pounds	August, 1921 Value	August, 1922 Pounds	August, 1922 Value
UNMANUFACTURED				
India rubber	1,002,260	$205,848	632,135	$97,833
Balata	2,539	1,011	62,337	30,438
Jelutong (Pontianak)	.....	.....	12,240	1,430
Totals, unmanufactured	1,004,799	$206,859	706,712	$129,701
MANUFACTURED				
Gutta percha and india rubber	.....	$1,479	.....	$2,132
India rubber substitutes	.....	.....	.....	.....
Totals, manufactured	.....	$1,479	.....	$2,132

[1]Details of exports of domestic merchandise by countries during August, 1922, appeared on pages 126 to 129 of our November issue.

Custom House Statistics

New York

Imports

	September, 1921 Pounds	September, 1921 Value	September, 1922 Pounds	September, 1922 Value
UNMANUFACTURED—*free*				
Crude rubber				
From Belgium	11,200	$844	.....	.....
France	.....	.....	224,120	$20,171
Netherlands	1,362,870	221,670	67,195	11,782
England	5,123,590	744,497	807,324	118,070
Dutch West Indies	.....	.....	8,855	445
Brazil	1,535,785	165,565	976,697	132,945
Colombia	4,712	1,350	5,150	990
Peru	65,816	6,979	216,505	33,653
British India	41,468	20,251	65,380	12,796
Ceylon	.....	.....	3,121,107	450,689
British East Indies	5,752,420	676,835	.....	.....
Dutch East Indies	5,024,109	684,696	.....	.....
Straits Settlements	14,706,894	2,108,118	29,932,393	4,096,537
Java	.....	.....	3,833,926	582,662
Other Dutch East Indies	.....	.....	3,173,542	490,127
French Indo China	.....	.....	20,329	6,233
Totals	33,628,864	$4,630,805	42,452,523	$5,957,100
Balata	218,102	123,890	119,332	79,260
Jelutong (Pontianak)	250,306	14,849	28,140	2,825
Gutta percha	166,170	22,419	52,956	8,946
Totals	34,263,442	$4,791,963	42,622,951	$6,048,131
Rubber, scrap and reclaimed	62,744	5,122	56,415	4,247
Totals, unmanufactured	34,326,186	$4,797,085	42,679,366	$6,052,378
MANUFACTURED				
Manufactures of rubber and gutta percha ..... *dutiable*	.....	$62,382	.....	$97,123
Rubber substitutes ... *dutiable*	.....	.....	.....	.....
Chicle ..... *dutiable*	128,445	69,280	264,502	127,913

States by Countries During September, 1922—*Continued*

Waterproofed Clothing Value	Pneumatic Casings: Automobile Number	Pneumatic Casings: Automobile Value	Pneumatic Casings: Others Value	Solid Tires: Automobile Value	Solid Tires: Others Value	Pneumatic Tubes: Automobile Number	Pneumatic Tubes: Automobile Value	Pneumatic Tubes: Others Value	Druggists' Rubber Sundries: Tire Repair Materials Value	Druggists' Rubber Sundries: Sundries Value	Hard Rubber Goods: Battery Jars and Accessories Value	Hard Rubber Goods: Other Electrical Supplies Value	Hard Rubber Goods: Others Value	All Other Rubber Manufactures Value	Totals Value
$102	2,500	$35,428	$29	$2,535	$18,289	2,957	$4,814	$24	$32	$2,002	.....	.....	.....	$7,332	$95,931
64	2,680	47,286	203	9,432	868	1,095	2,207	.....	853	2,211	$702	$21	.....	8,366	93,337
.....	11	129	.....	.....	.....	23	64	.....	.....	.....	.....	.....	.....	.....	351
20	23	231	9	43	242	10	14	.....	.....	.....	.....	.....	.....	.....	1,857
.....	3,736	48,053	148	5,128	.....	1,497	3,286	40	1,910	174	1,237	.....	.....	1,555	67,150
.....	78	779	.....	.....	.....	36	57	.....	.....	22	.....	.....	.....	.....	1,413
$186	9,028	$131,906	$389	$17,138	$19,399	5,618	$10,442	$64	$2,795	$4,409	$1,939	$21	.....	$17,253	$260,039
.....	662	$14,786	.....	.....	.....	410	$928	$220	.....	.....	.....	.....	.....	.....	$15,934
$1,995	8,084	77,292	$721	$1,084	.....	2,100	5,070	351	$587	$297	.....	$135	$384	$2,363	164,989
.....	602	6,903	86	.....	.....	152	236	.....	63	.....	.....	.....	.....	.....	7,798
.....	791	9,977	106	1,523	.....	461	880	11	35	.....	.....	.....	.....	3	12,535
.....	744	7,854	620	.....	$236	351	602	59	173	.....	.....	.....	.....	84	10,065
.....	43	389	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	389
.....	124	1,813	.....	.....	.....	96	246	.....	.....	.....	.....	.....	.....	.....	2,069
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	157	584
.....	270	2,748	80	1,670	.....	235	482	98	250	.....	.....	.....	.....	11	5,865
.....	104	1,615	.....	1,561	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3,330
$1,995	10,424	$123,377	$1,613	$5,838	$236	3,805	$8,444	$739	$1,108	$297	.....	$135	$384	$2,618	$223,548
$29,288	107,457	$1,241,360	$9,971	$112,897	$29,967	72,858	$129,481	$4,388	$22,960	$55,660	$5,391	$3,083	$41,895	$204,157	$2,899,662

Custom House Statistics—*Continued*

Exports

	September, 1921 Pounds	September, 1921 Value	September, 1922 Pounds	September, 1922 Value
MANUFACTURED				
Rubber, scrap and reclaimed	144,381	$6,315	288,715	$17,332
Automobile and other tires, *number*	.....	837,865	154,517	1,092,554
Inner tubes .....*number*	.....	76,595	61,769	106,787
Tire repair materials.....	.....	.....	32,892	12,191
Boots and shoes.....*pairs*	236,592	254,242	203,222	150,461
Canvas shoes with rubber soles .....*pairs*	.....	.....	169,327	136,071
Soles and heels.....	.....	27,640	104,280	45,093
Battery jars and accessories.	.....	.....	8,945	1,852
Other electrical supplies....	.....	.....	3,309	1,731
Other hard rubber goods....	.....	.....	32,794	29,083
Druggists' rubber sundries..	.....	39,127	32,569	39,285
Belting, hose and packing..	.....	131,387	415,188	179,691
Thread	.....	.....	48,000	50,647
Other rubber manufactures..	.....	193,392	170,403	128,699
Totals, manufactured...	.....	$1,566,563	.....	$1,991,477

Foreign Exports

Crude rubber.....	.....	.....	10,502	$2,935
Balata	122,650	$36,324	31,087	15,055
Gutta percha.....	.....	.....	.....	.....
Rubber, scrap and reclaimed.	.....	.....	.....	.....
Rubber manufactures.....	.....	1,425	.....	752
Chicle	.....	.....	.....	.....

Imports of Crude Rubber into the United States by Customs Districts

	September, 1921 Pounds	September, 1921 Value	September, 1922 Pounds	September, 1922 Value
Vermont	.....	.....	135	$21
Massachusetts	313,940	$29,569	582,214	67,400
New York.....	33,628,864	4,630,805	42,452,523	5,957,100
Maryland	.....	.....	1,180,630	156,337
Los Angeles.....	166,121	18,513	56,100	8,415
San Francisco.....	253,521	33,318	28,260	7,500
Colorado	.....	.....	45,000	5,363
Oregon	11,049	1,600	.....	.....
Washington	172,916	34,636	.....	.....
Totals.....	34,546,411	$4,748,441	44,344,862	$6,202,136

"MINITMEND" FOR COLD REPAIRING OF PUNCTURES, CUTS, TIRE blisters, and blowouts, as well as for replacing valve pads, splicing tubes, and mending rubber clothing or other articles, is made from high grade upriver Pará rubber. It is packed in cans to hold enough for 50 repairs.—The Colonial Rubber Co., 1142 North Hancock street, Philadelphia, Pennsylvania.

H. P. SICKELS, 840 UNIVERSITY AVENUE, ROCHESTER, NEW YORK, manufactures toy balloon valves of wood to sample or design.

Rubber Statistics for the Dominion of Canada

Imports of Crude and Manufactured Rubber

	August, 1921 Pounds	August, 1921 Value	August, 1922 Pounds	August, 1922 Value
UNMANUFACTURED—*free*				
Rubber, gutta percha, etc.				
From United Kingdom	8,960	$1,656	624,709	$87,196
United States.....	906,953	145,041	728,627	106,188
British East Indies				
India	.....	.....	40,341	7,260
Straits Settlements....	376,360	64,767	282,281	40,284
Totals	1,292,273	$211,464	1,675,958	$240,928
Rubber recovered.....	73,966	9,607	57,063	4,896
Rubber, powdered, and rubber or gutta percha scrap.....	77,592	1,806	230,994	5,152
Balata	.....	.....	3,171	840
Rubber substitutes.....	6,060	1,543	50,782	4,164
Totals, unmanufactured.....	1,449,891	$224,420	2,017,968	$255,980
PARTLY MANUFACTURED				
Hard rubber sheets and rods....	197	$242	1,125	$1,301
Hard rubber tubes.....	.....	.....	.....	1,240
Rubber thread, not covered.....	5,460	8,202	6,691	7,546
Totals, partly manufactured.	5,657	$8,444	7,816	$10,087
MANUFACTURED				
Belting	.....	$3,184	.....	$5,985
Hose	.....	8,984	.....	14,894
Packing	.....	4,730	.....	2,865
Boots and shoes.....*pairs*	.....	4,860	5,335	8,545
Clothing, including waterproofed.	.....	15,168	.....	13,062
Gloves	.....	1,074	.....	1,405
Hot water bottles.....	.....	110	.....	404
Tires, solid	.....	15,357	.....	11,997
Tires, pneumatic	.....	93,845	.....	113,478
Inner tubes	.....	13,527	.....	13,651
Elastic, round or flat.....	.....	32,610	.....	41,042
Mats and matting.....	.....	51	.....	3,227
Cement	.....	2,396	.....	4,495
Other rubber manufactures.....	.....	93,204	.....	104,945
Totals, manufactured.....	.....	$289,100	.....	$339,995
Totals, rubber imports.....	1,455,548	$521,964	2,031,119	$606,062

Exports of Domestic and Foreign Rubber Goods

	August, 1921 Produce of Canada Value	August, 1921 Reexports of foreign Goods Value	August, 1922 Produce of Canada Value	August, 1922 Reexports of Foreign Goods Value
UNMANUFACTURED				
Crude and waste rubber.....	$5,240	$56	$1,994	.....
MANUFACTURED				
Belting	.....	.....	$14,143	.....
Canvas shoes with rubber soles..	$14,495	.....	80,033	.....
Boots and shoes.....	9,117	.....	35,651	.....
Clothing, including waterproofed.	1,038	.....	702	.....
Hose	10,983	.....	7,715	.....
Tires, casings	.....	.....	364,751	.....
inner tubes.....	.....	.....	21,385	.....
pneumatic	180,511	.....	.....	.....
solid	3,052	.....	13,174	.....
vehicle	.....	$436	.....	$135
Other rubber manufactures.....	7,437	3,405	17,741	4,190
Totals, manufactured.....	$226,633	$3,841	$555,295	$4,325
Totals, rubber exports.....	$231,873	$3,897	$557,289	$4,325

United Kingdom Rubber Statistics

Imports

	September, 1921		September, 1922	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
From—				
Straits Settlements	2,553,800	£98,191	2,812,500	£116,172
Federated Malay States	3,536,000	143,038	2,882,100	124,924
British India	395,500	16,157	412,200	16,477
Ceylon and Dependencies	2,474,000	102,775	2,114,700	79,672
Other Dutch Possessions in Indian Seas	768,700	29,603	153,000	6,534
Dutch East Indies (except other Dutch Possessions in Indian Seas)	674,900	25,315	626,200	23,778
Other countries in East Indies and Pacific, not elsewhere specified	224,800	9,552	77,400	2,723
Brazil	290,300	11,632	329,100	12,501
South and Central America (except Brazil and Peru)	40,300	1,806	99,700	4,230
West Africa				
Gold Coast	700	24	.....	.....
Other parts of West Africa	.....	.....	1,400	41
East Africa (including Madagascar)	7,200	288	17,000	499
Other countries	.....	.....	70,700	2,052
Total	20,337,500	£438,381	9,596,000	£389,603
Waste and reclaimed rubber	92,800	869	51,200	572
Gutta percha and balata	132,300	28,790	1,131,400	141,034
Rubber substitutes	.....	.....	.....	.....
Totals, unmanufactured	30,853,900	£468,040	10,778,600	£531,209
MANUFACTURED				
	1,909	£8,016	3,020	£8,257
Tires and tubes...*number*	225,455	584,913	337,738	321,564
Other rubber manufactures	.....	55,989	.....	79,987
Totals, manufactured	.....	£649,008	.....	£409,808
Waterproof clothing, *number*	2,260	£3,365	1,423	£863
Insulated wire	.....	4,310	.....	13,506
Submarine cables	.....	.....	.....	.....

Exports

UNMANUFACTURED				
Waste and reclaimed rubber	364,500	£7,632	310,500	£4,689
Rubber substitutes	78,600	1,963	19,700	578
Totals, unmanufactured	443,100	£9,595	330,200	£5,267
MANUFACTURED				
Boots and shoes.*doz. pairs*	10,192	£20,020	15,344	£25,267
Tires and tubes...*number*	139,920	165,347	182,150	170,423
Other rubber manufactures	.....	175,686	.....	198,137
Totals, manufactured	.....	£361,053	.....	£393,827
Waterproof clothing, *number*	81,743	£119,725	83,222	£105,429
Insulated wire	.....	68,314	.....	61,463
Submarine cables	.....	56,502	.....	4,956

Exports—Colonial and Foreign

	September, 1921		September, 1922	
	Pounds	Value	Pounds	Value
UNMANUFACTURED				
Crude rubber				
To Russia	.....	.....	3,795,500	£115,424
Sweden, Norway and Denmark	10,300	£396	136,300	4,491
Germany	1,533,600	43,861	847,900	31,511
Belgium	254,200	9,204	77,300	2,616
France	2,146,500	82,311	2,295,800	77,982
Spain	44,700	1,833	39,000	1,258
Italy	321,200	10,904	706,500	22,871
Austria	44,300	1,834	.....	.....
Other European countries	893,700	33,016	138,700	6,613
United States	7,500,300	278,291	1,505,200	50,758
Canada	49,500	1,696	245,400	8,636
Other countries	.....	.....	49,100	2,082
Totals	12,798,300	£463,346	9,836,700	£324,242
Waste and reclaimed rubber	11,000	140	1,100	26
Gutta percha and balata	90,500	16,734	67,000	8,145
Rubber substitutes	.....	.....	.....	.....
Totals, unmanufactured	12,899,800	£480.220	9,904,800	£332,413
MANUFACTURED				
Boots and shoes.*doz. pairs*	502	£1,866	212	£1,393
Tires and tubes...*number*	31,510	22,039	12,501	12,652
Other rubber manufactures	.....	2,844	.....	2,343
Totals, manufactured	.....	£26,749	.....	£16,388
Waterproof clothing, *number*	160	£71	39	£14
Insulated wire	.....	.....	.....	.....
Submarine cables	.....	.....	.....	.....

The Market for Rubber Scrap

New York

The trend of the month in rubber scrap grades has been distinctly toward better business and prices. Boots and shoes are the most active item in the list showing a notable gain in price with plenty of stock being held for further anticipated advance. Offerings to consumers range from 3¾ to 4 cents a pound, delivered. Business in inner tubes in all grades is developing increased activity at higher prices. Number 1 tubes selling at 4½ to 5 cents a pound a full cent a pound above the quotations of last month. In mixed tires and auto peelings some inquiry has appeared following weeks of stagnation in this grade and good demand is reflected at present quotations of 1¼ to 1½ cents a pound. Mechanical grades still are without market rating or interest. Clean truck tires and solid carriage tire stocks are rated somewhat above auto peelings which seems inconsistent in view of their comparative quality and the greater expense involved in reclaiming, although they yield reclaimed stocks of special merit.

Quotations for Carload Lots Delivered

November 25, 1922

Prices subject to change without notice

Boots and Shoes			
Boots and shoes, black	*lb.*	$0.03¾ @	$0.04
Trimmed arctics	*lb.*	.02½ @	.03
Untrimmed articles	*lb.*	.02¼ @	.02½
Hard Rubber			
Battery jars, black compound	*lb.*	*.01 @	
glossy	*lb.*	.08 @	.10
Inner Tubes			
No. 1	*lb.*	.04¼ @	.05
Compounded red	*lb.*	.03¾ @	.04
Mechanicals			
Black scrap, mixed	*lb.*	*.01½ @	
Heels	*lb.*	*.02½ @	.03
Horse-shoe pads	*lb.*	*.02½ @	.03
Hose, air brake	*lb.*	*.01 @	.01½
regular	*lb.*	*.01 @	
Red scrap, mixed	*lb.*	*.07 @	.08
White scrap, mixed	*lb.*	*.07 @	.07½
Tires			
Pneumatic			
Auto peelings	*lb*	.01¼ @	.01½
Bicycle	*lb.*	.01 @	.01¼
Standard white auto	*lb.*	*.02½ @	.02¾
Mixed auto	*lb.*	.00¾ @	.01
Stripped, unguaranteed	*lb.*	*.01 @	.01½
Solid			
Carriage	*lb.*	.02¾ @	.03
Irony	*lb.*	@	
Truck, clean	*lb.*	.01¼ @	.02

*Nominal.

Plantation Rubber Exports from Java and Madura

	August		Eight Months Ended August 31	
	1921	1922	1921	1922
To Netherlands ...*kilos*	372,000	180,000	4,349,000	2,655,000
Great Britain	424,000	147,000	6,071,000	3,460,000
Germany	103,000	130,000	354,000	767,000
France	9,000	46,000	60,000	171,000
Italy	.....	39,000	.....	108,000
United States	1,628,000	1,507,000	5,734,000	11,290,000
Singapore	169,000	258,000	1,807,000	2,097,000
Japan	5,000	36,000	108,000	106,000
Australia	.....	.....	211,000	93,000
Other countries	.....	.....	.....	11,000
Totals ...*kilos*	2,710,000	2,343,000	18,694,000	20,658,000
Ports of origin:				
Tandjong Priok	1,297,000	1,047,000	8,427,000	8,376,000
Soerabaya	1,363,000	1,012,000	8,494,000	10,300,000
Samarang	17,000	89,000	317,000	482,000

The Market for Cotton and Other Fabrics

New York

AMERICAN COTTON. Spot Middling Uplands advanced to the 24-cent level October 24 and has held consistently above that point for a month, reaching 26 4/5 cents November 10. This high advance was attributed to belief that the government crop estimate of 10,100,000 bales was excessive and expectation that manufacturers' requirements will be 200,000 bales in excess of last year. There were no indications that the advance was slowing up the demand.

Following the middle of the month a general downward movement set in, due to falling off in volume of sales. The decline reached 25.7 cents on November 25.

EGYPTIAN COTTON. On November 14 a cable report stated: "Alexandria futures closed at 38⅛ cents for January Sakel and 31⅞ for December. Uppers market strong with upward tendency. In anticipation of higher prices holders show reluctance to sell. Government estimate crop at 4,000,000 cantars." The crop quality is reported to be high. The previous crop was estimated at 3,300,000 cantars. (One cantar equals 98 pounds.)

Early in the month quotations for prompt shipment c. i. f. Boston were as follows: Medium Sakellaridis, 32¾ cents unchanged from October 25; Medium Uppers, 29⅛ cents—off ⅛-cent. One week later quotations on these grades had advanced to 34¼ cents and 30 cents, respectively, followed in another week by further advances to 39⅛ cents and 34½ cents for the same grades. A month ago quotations on Medium Sakellaridis and Medium Uppers were 34 and 30 cents, respectively. The present advance is attributable to scarcity of these as well as the lower grades and the active demand.

SEA ISLANDS. The quantity of Sea Islands will be relatively unimportant. Spinners are cautioned to take great care that no Meade cotton is mixed with their shipments.

ARIZONA COTTON. Arizona cotton is sold as fast as it appears on the market. The crop will probably not reach 35,000 bales total. The 1¼-inch cotton planted last spring in the Salt River Valley has not turned out as satisfactory as anticipated and there has been a good deal of crossing of this cotton with Pima, causing much waste and mixed staple in both grades where fields have joined. Latest advices indicate that considerably more 1¼-inch cotton will be planted another season.

Cotton Fabrics

DRILLS, DUCKS AND OSNABURGS. In these lines the market is firm. Goods are scarce and actively sought for by consumers. Factory production is well engaged into the spring months of next year, with many contracts running through to June.

RAINCOAT FABRICS. Revival of the raincoat industry is noted in the improved call for staple goods especially in the low-price numbers, resulting in good business for the fabric manufactured.

HOLLANDS. A new advance in price in November is noted with further increase probable in the near future.

SHEETINGS. Buying has slowed up somewhat. The market, however, is very firm. Mills are in strong position with orders on hand sufficient to take capacity output through the first three months of next year.

TIRE FABRICS. The prices for tire fabrics are much improved. The increasing popularity of cord tires has resulted in selling the capacity production of cord manufacturers for several months ahead. Most mills are reported as covered with orders to run until next April.

LABELING TIRES WITH MOLDED RUBBER LABELS SECURED TO THE casing by vulcanization is covered by British patent No. 181,287, recently granted to M. J. Gilligan, 36 Tunstall Block, Vancouver, British Columbia, Canada.

New York Quotations

November 25, 1922

Prices subject to change without notice

Burlaps			
40—7-ounce	100 yds.		@
40—7½-ounce		$6.85	@ $6.90
36—8-ounce			@
40—8-ounce		6.90	@ 7.00
40—10-ounce		8.40	@ 8.50
40—10½-ounce		8.50	@ 8.55
Drills			
38-inch 2.00-yard		.25	@
40-inch 3.47-yard		.14¼	@
52-inch 1.90-yard		.27½	@
60-inch 1.52-yard		.34¼	@
Duck			
CARRIAGE CLOTH			
38-inch 2.00-yard enameling duck	yard	.25	@
40-inch 1.47-yard		.33⅓	@
72-inch 16.66 ounce		.55⅛	@
72-inch 17.21-ounce		.57	@
MECHANICAL			
Hose	pound	.49	@
Belting		.48	@
Osnaburgs			
40-inch 2.35-yard		.20⅞	@
40-inch 2.48-yard		.19⅞	@
37½-inch 2.42-yard		.20¼	@
Hollands			
DULL FINISH			
Standard, 37-inch, white and colors		.19½	@
42-inch, white and colors		.23½	@
FLAT FINISH			
Imperial, 36-inch, white and colors		.15½	@
40-inch, white and colors		.17½	@
Raincoat Fabrics			
COTTON			
Bombazine 64 x 60	yard	.14	@
60 x 48		.12¾	@
Cashmeres, cotton and wool, 36-inch, tan			@
Plaids 60 x 48		.13	@
56 x 44		.12¾	@
Surface prints 60 x 48		.14	@
64 x 60		.15	@
Sheetings, 40-inch			
48 x 48, 2.50-yard	yard	.18	@ .18¼
48 x 48, 2.85-yard		.15¼	@ .15½
64 x 68, 3.15-yard		.15½	@ .15¾
56 x 60, 3.60-yard		.13½	@ .13¾
48 x 44, 3.75-yard		.12	@ .12¼
Silks			
Canton, 38-inch	yard		@
Schappe, 36-inch			@
Tire Fabrics			
BUILDING			
17¼-ounce Sakellaridis, combed	pound	.79	@
17¼-ounce Egyptian, combed		.73	@
17¼-ounce Egyptian, carded		.67	@
17¼-ounce Peeler, combed		.75	@
17¼-ounce Peeler, carded		.55	@ .60
CORD			
15-ounce Egyptian, combed	pound	.76	@
15-ounce Egyptian, carded			@
15-ounce Peeler, carded			@
BICYCLE			
8-ounce American	pound		@
10-ounce American			@
CHAFER			
9¼-ounce Egyptian, carded	pound	.75	@
9¼-ounce Peeler, carded		.66	@ .68

The Market for Chemicals and Compounding Ingredients

New York

IN the list of compounding ingredients as a whole there have been but few and minor changes in price. Business in compounding materials has been active, reflecting the steadily improving manufacturing conditions in the rubber industry. The pre-inventory curtailment of consumers' business is due next month but will apparently be notably less than a year ago because of improved industrial outlook in all lines

ANILINE. Supplies are light, causing firmness in prices in view of a steady demand for the material.

ANTIMONY SULPHURET. Stocks are abundant and prices low. Consumers' requirements continue moderate especially in the rubber trade.

BARYTES. Shippers are seriously hampered by the poor condition of railway rolling stock and by freight embargoes at various eastern points. These restrictions interfere with meeting the liberal demand for barytes.

CARBON BISULPHIDE. There is said to be a shortage of stocks, but this has very little price influence in the absence of lack of requirements for the material.

CARBON BLACK. The supply of carbon black at the various producing points is ample to meet the active demand of consumers which is said to be better than last year. The shortage of freight cars has for months seriously interfered with supplying consumers' needs.

CARBON TETRACHLORIDE. This is not an active factor at present and the supply has necessarily been kept low.

CHINA CLAY. Manufacturers of tires, heels and mechanical goods are active consumers of this material because of the abrasive resistance it imparts to their products as well as its advantage of cheapness. Lack of ability on the part of the railroads to move the material is the chief restraining condition.

DRY COLORS. Dry colors generally are in good request for the season at prices that show no general advance over a considerable past period.

LITHARGE. There has been a steady improvement in business. Early in the past month the price was increased ½-cent a pound without reducing the volume of consumers' orders.

LITHOPONE. Manufacturers of lithopone are busy on full production. A cut in price by one manufacturer was not followed by similar action on the part of others, nor has there been a general advance. As yet there has been no influx of lithopone from foreign sources.

SOLVENT NAPHTHA. The supply is short. Business is brisk at unchanged prices.

SUBLIMED LEAD. The same conditions hold as in the case of litharge. Consumers' requirements are being met in good volume at an advance of ½-cent a pound since the first of the month.

SULPHUR. Steady routine conditions characterize the position and consumption of sulphur.

SULPHUR CHLORIDE. Like sulphur, this vulcanizing agent is dull and seasonal.

TALC. Both domestic and foreign grades are active regardless of tariff conditions.

WHITING. In this basic compounding ingredient consumption is liberal even under the seasonal routine conditions now prevailing. Prices are low and steady.

ZINC OXIDE. As a toughener and essential for producing abrasive resistance in rubber stocks zinc oxide holds a recognized market position. It is important in the manufacture of tires and other rubber products where long wear and color is a factor.

Prices for the month have held without change and consumption by rubber manufacturers has been in good volume.

New York Quotations

November 25, 1922

Prices subject to new tariff revision

Accelerators, Organic			
Accelerene (f. o. b. English port)	lb.	13s.	@
Accelemal	lb.		@
Aldehyde ammonia crystals	lb.	$0.95	@
Aniline (f. o. b.) factory	lb.	.16¼	@
Diphenyl guanidine	lb.	1.25	@$1.40
Ethylidene aniline	lb.	.80	@ .85
Excellerex	lb.		@
Formaldehyde aniline	lb.	.52½	@
Hexamethylene tetramine	lb.	.95	@ .97½
Lead oleate (bbls.)	lb.	.14	@
Methylene aniline	lb.	.40	@
Methylene paratoluidine	lb.	1.40	@
N. C. C.	lb.		@
No. 999	lb.	.14½	@
Paradin	lb.	.37	@
Paraphenylene diamine	lb.	1.50	@ 1.55
Super-sulphur, No. 1	lb.	.50	@ .60
No. 2	lb.	.25	@ .30
Super-X	lb.	.50	@
Super-XX	lb.	.80	@
Thiocarbanilide	lb.	.29	@ .31
Vul-Ko-Cene	lb.	.35	@
XLO	lb.	1.05	@
Accelerators, Inorganic			
Lime, flour, superfine	lb.	.02	@ .02½
Litharge, domestic	lb.	.08½	@
imported	lb.	*.17	@
Magnesia, carbonate, light	lb.	.07½	@ .08
calcined, light (bbls.)	lb.	.22	@ .24
calcined, ex. light (bbls.)	lb.	.45	@
calcined, md. light (bbls.)	lb.	.15	@
calcined, heavy (bbls.)	lb.	.03	@ .03½
oxide	lb.		@
Acids			
Acetic 28% (bbls.)	cwt.	2.92½	@ 3.67½
glacial, 99%	cwt.	11.16	@11.91
Cresylic (97% straw color)	gal.	.60	@ .62
(95 dark)	gal.	.55	@ .57
Sulphuric, 66 degrees	ton	14.00	@16.00
Alkalies			
Caustic soda	cwt.	3.50	@ 3.75

*Nominal.

Colors			
BLACK			
Bone, powdered	lb.	$0.05½	@$0.07½
Carbon black	lb.	.16	@ .22
pressed	lb.	.16½	@
Dipped goods	lb.		@
Drop	lb.	.07½	@ .16
Gritless black	lb.	.40	@
Hyposulphite of lead	lb.		@
Iron oxide	lb.	.04½	@ .16
Ivory black	lb.	.15	@ .45
Lampblack	lb.	.12	@ .40
Micronex	lb.	.17	@ .24
BLUE			
Dipped goods	lb.		@
Gritless blue	lb.	3.50	@
Prussian	lb.	.55	@ .60
Ultramarine	lb.	.10	@ .35
BROWN			
Iron oxide	lb.		@
Sienna, Italian	lb.	.05½	@ .14½
Umber, Turkey	lb.	.04	@
Vandyke	lb.	.03½	@ .04½
GREEN			
Chrome, light	lb.	.30	@ .32
medium	lb.	.35	@ .36
dark	lb.	.36	@ .45
commercial	lb.	.12	@
tile	lb.	.11	@ .13
Dipped goods	lb.		@
Gritless green	lb.	3.50	@
GREEN—*Continued*			
Guignet	lb.	$1.50	@
Oxide of chromium	lb.	.55	@
RED			
Antimony, crimson	lb.	.40	@
crimson, 15/17% free	lb.	.34	@$0.48
crimson, R.M.P. No. 3	lb.	.50	@
crimson F	lb.	.35	@
Antimony, golden	lb.	.21	@
golden R.M.P. No. 7	lb.	.21	@
golden, 15/17% free	lb.	.19	@ .24
golden, No. 1	lb.	.30	@
golden, No. 2	lb.	.25	@
7-A	lb.	.35	@
vermilion 15/17% F. S.	lb.	.50	@
vermilion 5% F. S.	lb.	.65	@
red sulphuret, 15/17%	lb.	.20	@
Arsenic sulphide, red	lb	.12¼	@ .14
lemon	lb.		@
orange	lb.		@
Dipped goods red	lb.		@
purple	lb.		@
orange	lb.		@
Gritless red (four shades)	lb.	3.50	@
purple	lb.	2.50	@
Indian	lb.	.08	@ .12
Indian maroon, English	lb.	.12	@ .15
Iron oxide, reduced	lb.	.12	@
pure bright	lb.	.14	@
Maroon oxide	lb.	.08	@ .12
Red oxide, crimson	lb.		@
English	lb.		@
Spanish	lb.	.04½	@
Oximony	lb.	.16	@
Para toner	lb.	1.00	@ 1.10
Spanish natural	lb	.03½	@ .04½
Venetian	lb.	.03½	@ .06
Vermilion, American	lb.	.25	@ .30
English quicksilver	lb.	1.25	@ 1.30
WHITE			
Albalith	lb.	.06	@ .06½
Aluminum bronze	lb.	.55	@ .60
Lithopone, domestic	lb.	.06	@ .06½
Zinc oxide:			
American Horse Head Special	lb.	.07½	@ .08
XX red	lb.	.07	@ .07½

Chemical Market—*Continued*

New York Quotations

November 25, 1922

Prices subject to new tariff revision

Colors

WHITE—*Continued*

French process, Florence			
Green seal	*lb.*	$0.09¾ @	$0.10¼
Red Seal	*lb.*	.08¾ @	.09¼
White seal	*lb.*	.11 @	.11¼
Azo (factory):			
ZZZ (lead free)	*lb.*	.07 @	.07½
ZZ (—5% leaded)	*lb.*	.06¼ @	.06¾
Z (8.10% leaded)	*lb.*	.06 @	.06½
Zinc sulphide	*lb.*	.45 @	

YELLOW

Arsenic, yellow	*lb.*	.75 @	
Cadmium, sulphide, light	*lb.*	1.85 @	
Chrome, light and med.	*lb.*	.17 @	
Dipped goods	*lb.*	@	
Gritless yellow	*lb.*	3.50 @	
India rubber	*lb.*	87½ @	
Ochre, domestic	*lb.*	.02½ @	.03
imported	*lb.*	.02⅜ @	.03½

Compounding Ingredients

Aluminum flake (carloads)	*ton*	22.50 @	29.00
hydrate, light	*lb.*	.16 @	.18
Ammonia carbonate	*lb.*	.09½ @	.10¼
Asbestine	*ton*	20.00 @	25.00
Aluminum silicate	*ton*	@	
Barium, carbonate, precip.	*ton*	75.00 @	80.00
dust	*ton*	100.00 @	
Barytes, pure white C. L.	*ton*	23.90 @	
off color (carloads)	*ton*	20.00 @	
uniform floated (carloads)	*ton*	23.90 @	
Basofor	*lb.*	.04¾ @	
Blanc fixe	*lb.*	.04¼ @	.04½
Carrara filler (factory)	*lb.*	@	
Chalk, precip. extra light	*lb.*	.03½ @	.04¼
heavy (f.o.b. factory)	*lb.*	.02½ @	.03¼
China clay, Dixie	*ton*	22.00 @	32.00
Blue ribbon (carloads)	*ton*	14.00 @	
Blue Ridge	*ton*	22.00 @	32.00
Cotton flock, black	*lb.*	@	
light-colored	*lb.*	@	
white	*lb.*	@	
Cotton linters clean mill-run	*lb.*	.06 @	
Fossil flour (powdered)	*ton*	60.00 @	
(bolted)	*ton*	60.00 @	
Glue, high grade	*lb.*	.30 @	.40
medium	*lb.*	.20 @	.26
low grade	*lb.*	.16 @	.19
Graphite, flake	*lb.*	.05 @	
amorphous	*lb.*	.05 @	
Infusorial earth (powd.)	*ton*	60.00 @	
(bolted)	*ton*	65.00 @	
Mica, powdered	*lb.*	.15 @	
Pumice stone, powdered	*lb.*	.03 @	.05
Rotten st., powd. (bbls.)	*lb.*	.02½ @	.04½
Silica, gold bond (factory)	*ton*	@	
silver bond (factory)	*ton*	@	
Soap bark, cut	*lb.*	.08¾ @	.10
Soapstone, powdered, gray	*ton*	12.00 @	
Starch, powd. corn (bags)	*cwt.*	2.82 @	2.92
(bbls.)	*cwt.*	3.10 @	3.20
Talc, soapstone	*ton*	15.00 @	20.00
Terra blanche	*ton*	25.00 @	27.00
Tripoli flour, cream or rose	*ton*	@	
white (factory)	*ton*	@	
Tyre-lith	*ton*	$85.00 @	$90.00
Whiting, Alba	*cwt.*	@	
chalk	*ton*	@	
commercial	*cwt.*	1.00 @	1.25
Danish (factory)	*ton*	20.00 @	
English cliffstone	*cwt.*	1.75 @	2.00
gilders (bolted)	*cwt.*	1.15 @	
K. T.	*ton*	16.00 @	
Paris, white, American	*cwt.*	1.25 @	1.50
Perfection	*ton*	22.00 @	25.00
Plymouth	*ton*	16.00 @	18.00
Quaker	*ton*	13.00 @	15.00
Superfine	*ton*	22.50 @	
Wood pulp, XXX	*ton*	32.00 @	
X (f.o.b. factory)	*ton*	25.00 @	

Mineral Rubber

Gilsonite	*ton*	65.00 @	
Genasco (factory)	*ton*	60.00 @	62.00
Hard hydrocarbon	*ton*	32.00 @	42.00
Liquid rubber	*lb.*	.15 @	
Soft hydrocarbon	*ton*	30.00 @	35.00
320/340 M. P. hydrocarbon	*ton*	40.00 @	50.00
300/310 M. P. hydrocarbon	*ton*	35.00 @	45.00
Pioneer, M. R., solid (fac.)	*ton*	42.00 @	44.00
M. R. granular	*ton*	52.00 @	54.00
Robertson, M. R., solid	*ton*	35.00 @	75.00
M. R. granular (factory)	*ton*	54.50 @	72.50
Rubrax (factory)	*ton*	60.00 @	
States "A"	*ton*	@	
No. 1	*ton*	@	
Synpro, gran. M. R. (fac.)	*ton*	54.50 @	69.50

Oils

Avoilas compound	*lb.*	.13 @	
Castor, No. 1, U. S. P.	*lb.*	.13 @	
No. 3, U. S. P.	*lb.*	.12 @	
Corn	*lb.*	.10½ @	
Cotton	*lb.*	.12 @	
Glycerine	*lb.*	.18½ @	.19
Halowax (500-lb. drums)	*lb.*	.25 @	.27
Linseed, raw	*lb.*	.12 @	
Palm lagos	*lb.*	.09½ @	
Palm, niger	*lb.*	.08¼ @	
Peanut	*lb.*	.12 @	
Petrolatum, standard	*lb.*	.05 @	.08
Petrolatum, sticky	*lb.*	.08 @	.10
Pine, steam distilled	*gal.*	.82 @	.85
Rapeseed, refined	*gal.*	.85 @	
blown	*gal.*	.94 @	
Rosin	*gal.*	.41 @	.50
Synpro	*gal.*	.40 @	.80
Soya bean	*lb.*	.11½ @	
Tar	*gal.*	.25 @	.28

Resins and Pitches

Cumar resin hard	*lb.*	@	
soft	*lb.*	@	
Tar, pine, retort	*bbl.*	$10.00 @	11.50
kiln	*bbl.*	11.50 @	13.00
Pitch, Burgundy	*lb.*	.05 @	
coal tar	*lb.*	.01½ @	
hardwood	*lb.*	.02½ @	
pine tar	*lb.*	.03¼ @	
ponto	*lb.*	.07½ @	
Rosin, K (bbl.)	*280 lbs.*	7.10 @	
strained (bbls.)	*280 lbs.*	6.80 @	
Shellac, fine orange	*lb.*	.90 @	

Solvents

Acetone (98.99% drums [6.62 lbs. per gal.])	*lb.*	.20 @	.23
Benzol (90%, drums [7.21 lbs. per gal.])	*gal.*	@	
pure (drums)	*gal.*	.40 @	.42
Carbon bisulphide (drms. [10.81 lbs. per gal.])	*lb.*	.06½ @	.07¼
tetrachloride (drums. [13.28 lbs. per gal.])	*lb.*	.09½ @	.10½
Motor gasoline (steel bbls.)	*gal.*	.24 @	
Naphtha, V. M. & P.	*gal.*	.23 @	
solvent (drums extra)	*gal.*	.23 @	.25
Cymene (factory)	*lb.*	.15 @	
Toluol, pure (7.21 lbs. per gal.)	*gal.*	@	
Turpentine, spirits	*gal.*	1.60 @	
wood, steam distilled	*gal.*	1.50 @	

Substitutes

Black	*lb.*	.07 @	.13
Brown	*lb.*	.10 @	.14
White	*lb.*	.08 @	.16
Brown factice	*lb.*	.08 @	.15
White factice	*lb.*	.09 @	.15

Vulcanizing Ingredients

Black hypo	*lb.*	.25 @	.35
Sulphur chloride (drums)	*lb.*	.08 @	
(jugs)	*lb.*	.13½ @	
Sulphur, Bergenport brand, 100% pure (bbls.)	*cwt.*	2.55 @	2.90
(bags)	*cwt.*	2.30 @	2.65
Sulphur flour (bbls.)	*cwt.*	2.60 @	3.15
(bags)	*cwt.*	2.35 @	2.90
Superfine 100% pure	*cwt.*	2.60 @	3.15

(See also Colors—Antimony)

Waxes

Wax, beeswax, white, com.	*lb.*	.45 @	
ceresine, white	*lb.*	.12 @	
carnauba	*lb.*	.20 @	
montan	*lb.*	.03½ @	.03¾
ozokerite, black	*lb.*	.18 @	
green	*lb.*	.25 @	.26
paraffine	*lb.*	.02¾ @	.04⅞
sweet wax	*lb.*	.12 @	

*Nominal.

"IDEAL SECTION" OF LINCOLN HIGHWAY APPROACHING COMPLETION

According to present indications, the paving of the "Ideal Section" of the Lincoln Highway can be completed this year, while the installation of certain features, such as the system of electric lighting, can be finished next spring. J. N. Gunn, president of the Lincoln Highway Association and vice-president of the United States Rubber Co., which is providing most of the cost of the job, is expected personally to inspect the progress of the work in the near future.

Concrete Mixers at Work — Section of Finished Paving

Rapid Progress Being Made on Ideal Section of Lincoln Highway in Lake County, Indiana

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